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*“Read! In the name of your Lord Who has created (all that exists)”*

*Surat Al - 'Alaq (The Clot) XCVI*





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## FOREWORD

National Defence College has been striving since 1999 with a vision to be the premier national centre of excellence on leadership, defence, security, strategy and development studies - meeting the challenges of the 21st century. Since its inception, the college has been relentlessly presenting time - befitting academic curricula to the potential policy planners, senior leaders and strategic thinkers of the future. The college aims to create a balanced outlook and bring a visualization amongst the Course Members with a strategic and operational level understanding. The chronicles of past 20 years testify the viability of the academic system that has contributed to this leading institution in gaining reputation of excellence at home and abroad.

National Defence College being the highest level national institution in Bangladesh, has always been emphasizing on conducting research on contemporary issues of national importance. The common aim of research work is to enable Course Members to make original contribution to a subject of national or international interest, which has influence on national security and development. NDC journal reflects the notable research works carried out by Course Members and Faculty of the college. I am assertive that the Research Papers included in this journal encompassing varied subjects would be considerably useful for the readers.

I congratulate all authors who contributed to this journal. I appreciate the sincere efforts of Research and Academic Wing and acknowledge the hard work of editorial board to publish this journal in due time.



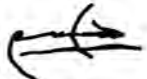
**SHEIKH MAMUN KHALED, SUP, rcds, psc, PhD**  
Lieutenant General  
Commandant

## EDITORIAL

NDC Journal is a bi-annual publication of National Defence College. The articles for this journal (Volume 18, Number 1, June 2019) have been selected mostly from individual research papers submitted by Course Members as part of course curricula.

The papers included in this journal reflect multi-dimensional issues related to national security and development. The ideas, opinions, and suggestions expressed in these papers have been developed through curricula-based discussions and discourse held during the course. These are purely non-attributive and bears the testimony of the research conducted by the course members.

We shall consider ourselves pleased to receive any suggestive criticism from the valued readers.



**Md Moshfequr Rahman**, SGP, SUP, ndc, psc  
Major General  
Senior Directing Staff (Army)



**ABSTRACT**

**BRACING ARTIFICIAL INTELLIGENCE FOR SOCIO-ECONOMIC DEVELOPMENT: OPPORTUNITIES, IMPLICATIONS AND CHALLENGES FOR BANGLADESH**

**Major General Md Wahid-Uz-Zaman, ndc, aowc, psc, te**

Artificial Intelligence is a life changer, a disruptive technology and a valuable tool for unending socio-economic developments. Major Asian nations are investing heavily in AI adoption. For Bangladesh, who aimsto become a Developed Nation by 2041, bracing AI is no longer a choice; rather appears to be the most important option to achieve the desired socio-economic growth and remain competitive in the global market. But there seems to be remoteness amongst the concerns, which needs immediate attention. Focusing on the above perspective, this research aims to: explore key socio-economic AI opportunities and their implications for Bangladesh, followed by identifying likely AI threats and the challenges; and finally to suggest an AI adoption strategy. This is a qualitative exploratory research. Major tools used are: extensive secondary literature review, Key Informant Interviews, Focused Group Discussion, Official Document Survey, Field Survey and the author's unbiased personal observation as an ICT engineer with 30 years of experience.

Of many AI applications: Agriculture, Manufacture and Service Sectors are the major recipients with enormous future potentials. Increased productivity, new job opportunity, uptrend micro and macro-economic indicators all are leading to a better socio-economic lifestyle. Opportunities in Education and Healthcare are equally bright also. Billions of IoT devices generating unfathomable quantity of data are the major drivers for AI expansion. AI will create unemployment and widen social inequality. Pronounced challenges in adopting AI in Bangladesh are: adapting to new kind of jobs, managing big data, knowledge and skill deficiencies, lack of research and innovation, disconnected mental capacity to economic growth, absence of policy, gaps in public private partnership and inadequate homegrown infrastructure. 'Digital Bangladesh' drive has created an IT base, which is conducive for adopting AI. But Bangladesh must emphasize on AI education and training, formulate appropriate policy with special focus on data management, recruit global talents, invest on innovation, support private initiative, develop home-grown infrastructures and create mass awareness. It should also form an AI Task Force with specific terms of references and enable AI-based sectoral development in agriculture, manufacturing, service sector, education and healthcare.

## **IN QUEST OF A CONDUCTIVE DEMOCRATIC ENVIRONMENT TO SECURE PEOPLES RIGHT IN BANGLADESH**

**Brigadier General Abul Fazal Md Sanaullah, SUP, hdmc, ndc, psc**

Democracy and human rights are like Siamese Twins – inseparable and interdependent. The democracy is inherently embedded in the notion of liberty and self-determination. Democracy however, does not have a monolithic construct. Indeed, it is difficult to compare between democracies as each is shaped by respective imperatives - socio-economic, historical, political, and others. Democratic environment of any given country would include and go beyond politics, governance, and, anything that affects life and living of the citizen. Further, contemporary issues, global trends and shifting priorities make democracy assume varying look. Bangladesh is a rather young democracy. Its neo-democratic phase since 1991, briefly interrupted in 2006, is about three decades old. The country has made significant strides towards ensuring economic wellbeing of its citizens. However, challenges remain in guaranteeing rights of the people to spirit enshrined in the constitution. To contextualize the ‘right’ paradigm with that against the democratic environment, it makes a rather intricate reading. Bangladesh’s challenges in this sphere range from performance of institutions to awareness of people. Economically the country is experiencing laudable uplift and so is the quality of life and living. This success is set to raise expectations to the next level. With the development of social capital, rise in perceptive and literary ability, and, improved institutional acumen, country can attain higher democratic and social fit. If achieved, people of the country can avail superior quality of rights – both socio-economic and political.

## **THE ROLE OF BANGLADESH ARMY IN NATIONAL FOOD SECURITY MANAGEMENT**

**Brigadier General Kazi Shameem Farhad, ndc, psc**

Food security is a matter of great concern for Bangladesh. Availability of food in Bangladesh has achieved but, still there are lot of rooms for improvement to make food affordable, accessible and to ensure quality and safe food. To get overall food security we need to have a well-coordinated effort for management of food from crop field to consumer. It has been perceived that Bangladesh Army’s wide involvement in rendering support to government in various disaster management and nation building activities may help to contribute in the National Food Security Management (NFSM). The objectives of this research are to review the concept

and connotation of Food Security and its management; to examine the current status, issues and challenges related to Food Security Management of Bangladesh and to study the nature of the existing contribution of contemporary armies and identify the possible engagements of Bangladesh Army in NFSM. This research essentially is an interpretive and qualitative in nature. Though it is qualitative, in some cases quantitative information are used. Initially effort is taken to identify the causes and impact of food insecurity. Thereafter, concept of management and its relation with food security are discussed. Subsequently, Bangladesh perspective of Food Security Management is discussed elaborately with a purview of present food security situation. Government's initiatives towards Food Security Management were also mentioned with a view to identifying the limitations and challenges. Next, the global engagements of contemporary armies and role of Bangladesh Army in NFSM are discussed. Finally, we come to conclusions that Bangladesh Army has the experience and capability to contribute in NFSM. Army can be asked to facilitate the easy accessibility to food, to produce animal source foods, to build agricultural equipment, to involve in forestation, to assist crops production by environmental protection, to help local government agencies to monitor safe food activities etc. for attaining the sustained NFSM with close coordination with all concerned government stakeholders.

## **PROSPECTS AND CHALLENGES OF DEEP SEA FISHING IN THE BAY OF BENGAL - OPTIONS FOR BANGLADESH**

**Captain M Sharif Uddin Bhuiyan (S), NGP, ndc, afwc, psc, BN**

Bangladesh is a Gangetic deltaic country with over 160 million inhabitants living on 150,000 sq.km of land, resulting in population density of about 1,237 per sq.km. She has 710 km long coast lines and sea area of about 1,18,813 sq.km. The limits on land availability and increasing soil salinity and other climate related challenges is one reason the country needs to harness the prospect and potentials of its coastal and marine fisheries resources for sustainable growth and economic development. Agriculture remains mainstay of Bangladesh's rural economy providing 18% of GDP, fishery sector contributes to 3.61% of GDP in 2017 and employs 11% of total population. Fish contributes to 60% of all animal protein consumed in the country making it one of the highest fish consuming nations in the world (GOB, Ministry of Planning). Interestingly in Bangladesh, people prefer sweet water fishes than the sea fishes. Whereas sea water fishes are also cheaper comparing to the international market. According to Ministry of Fisheries and Livestock (MFL) Annual Report 2016-17, Bangladesh harvested 63,476 MT Marine fish in 2016-17 and exported 68,305 MT fishes and fish products worth BDT 4287crore. There

are only 248 industrial trawlers and 67,669 mechanized and non-mechanized boats currently engaged in fishing in the Bay of Bangle (BoB) where about 475 fishing species are available. All types of boats and trawlers mostly fish within 40 meter depth and hardly tend to go beyond this area. Because, fishing community mostly depends on traditional fishing which have limitations of capacity, technology, and duration at sea, investment, infrastructure like landing stations, cold storage and processing facilities, knowledge, bad weather condition etc. The business community also find it difficult to invest in the sector because of lack of adequate data, skilled manpower, market knowledge, sea blindness, inadequate public and private infrastructures, lack of Govt conducive policy support, lack of access to convenient finance, poor law enforcement etc. Interestingly, Govt has been patronizing and promoting as thrust sectors like RMG, jute, tea, leather, ship building, pharmaceuticals, potatoes, vegetables etc with different fiscal incentives and policy support. But marine fishery sector yet to see such assistance and patronizations from the Govt. Many countries like Japan, Russia, China, Sri Lanka, and Thailand have been doing quite well in marine fisheries sector from whom Bangladesh can share experiences. Govt with the assistance of World Bank have recently taken a mega project for Sustainable Coastal and Marine Fisheries Project (SCMFP) for the period July 2018 to June 2023 worth of BDT 1,588 crore. If it is effectively materialized, the marine fishery sector is expected to have sustainable growth greatly contributing to the Blue Economy in future.

## **DEVELOPING HUMAN RESOURCE FOR AVIATION SECTOR: ROLE OF AVIATION UNIVERSITY OF BANGLADESH AIR FORCE**

**Air Commodore Md Shaharul Huda, ndc, psc, GD(P)**

Human resource is the most valuable strategic resource of a country. Effective development of this strategic resource is essential for a nation to progress. Academic institutions play critical role in preparing skilled human resource. Bangladesh, since 2007 is enjoying demographic dividend. At present, 65 percent of her population is within the age group of 15 and 64. Despite having this demographic advantage, Bangladesh could not exploit the potential so far as she could not create enough jobs for this working-age population. Bangladesh needs new professionals across various sectors including aviation to reap benefit of this demographic dividend. International Civil Aviation Organization forecasted that the growth of global air passenger would be doubled by 2030. Airbus estimated that air transport industry globally generates 57 million jobs. Asia Pacific region is expected to become largest air transport market of the world within next 10

year time. Such global trend of aviation expansion will definitely create ample opportunities on the aviation sector of Bangladesh. It is thus felt that the country should develop her human resource in aviation sector. Government has already recognized this and has planned to establish Aviation University to develop adequate human resource to meet the global need in aviation sector. At present, very few training institutes provide aviation related skill training. Most of the work force are retired Bangladesh Air Force personnel and some are from Biman Bangladesh Airlines Limited. The Aviation University of Bangladesh Air Force can harness all the scattered resource by bringing them under one umbrella and provide world class training. Bangladesh Air force already has necessary facilities and training institutes. These establishments and facilities can be affiliated to the Aviation University. Additionally, few more new institutes like; Center of Air and Space Studies, Institute of Aviation Management, Institute of Aviation Maintenance, Institute of Aviation Safety and Regulations and Institute of Aviation (Flying) can be created which would directly function under the Aviation University and offer graduation and post-graduation courses. Considering the global aviation growth trend, it is essential that Government of Bangladesh passes relevant law at the earliest and Aviation University of Bangladesh Air Force starts functioning.

## **CHALLENGES OF CONVERTING POPULATION INTO RESOURCES: AN EXPLORATORY STUDY IN SADAR UPAZILA OF RANGPUR DISTRICT**

**Joint Secretary Md Abdul Majid, ndc**

This study is to identify the challenges of converting population into human resources in Bangladesh. This is done on the basis of related secondary data, information and a field study on how efficiently and in what level this conversion process activities are being done in the country and in sadar upazila of Rangpur District. Conversion of population into Human Resource in Bangladesh is a challenging task. The country is highly blessed with abundance of human beings but not human resources. It has to be created through quality education and high skill training in planned way. The highly trained and properly processed human beings who could foster the dreams of the nation but these human beings remain poorly addressed. This untapped diverse resource is least explored for planned growth and development. Bangladesh is now severely suffering from huge high skill and medium skill shortage and professional experts in almost in all the fields. This research attempts to find out the challenges and weaknesses of our various complementary components of HRD and to suggest the realistic remedies for rapid growth of HRD and more development of Bangladesh.

The constitutional provisions in this regard and policy obligations, current conflicting streams and complex structures of education, statistical and analytical details of various indexes and status with general and technical-vocational education followed by regional and Asian education systems, population status and fertility including public health have been studied and analyzed deeply in this research work. The state of employment and unemployment for both the sex of male and female at home and abroad are duly focused in this research work. This study shows that population size is still a problem in converting population into human resource, because the population size is still increasing year by year. Population growth rate is still 1.37% and TFR is 2.3. Population dividend would be falling after 2040-50. Access to the formal TVET is very much limited in the country which debars a vast population to enter into it. Female students are relatively facing limited access to TVET system due to social stigma and lack of gender friendly environment in TVET institutions. Due to lack of necessary research TVET system is not sufficiently responding to update market demand.

Non-observance of constitutional obligations, dominance of general education, poor presence of technical and vocational education, weak educational infrastructures, poor population control, increasing migration to industrial and service sectors, poorly synergized education and employment prospect including lack of strong central HRD planning are the major challenges. To meet these challenges, the study recommends for creating creative and competitive human resource base by developing institutional synergy to promote overall HRD and establishing a culture of useful and fruitful education and training to increase of employment opportunity of labour forces inside and outside Bangladesh.

## **INDIA'S RELATIONS WITH AN INCREASINGLY ASSERTIVE JAPAN AND LIKELY IMPLICATIONS ON INDIA'S SECURITY POLICIES**

**Air Commodore Inderpal Singh Walia, AVSM, VM, ndc**

The Indo-Pacific region has become the stage for the new developing inter-power rivalry, as the US, China, Japan, India, Vietnam and the ASEAN nations now jostle for territories, strategic space and influence, amidst shifting levels of power. The gradual dis-engagement of US and the rapid growth of China, along with its aggressive economic and regional military poise, are the most important factors, determining regional geo-politics. Meanwhile, there has been a significant change in Japan's security outlook. Japan has modified its national security policies, the binding Article 9 and increased its defense spending. India seeks to create a bigger

regional role for itself, as it finds itself on the fore-front of the confrontation with China. The region sees intensifying rivalry for power and influence amongst all the neighbouring countries, occasionally manifesting in military confrontation in the form of territorial disputes. The region is also home to a very complex web of inter-relationships and alliances. India's relationship with any of the actors has a cascading ripple effect on its other existing regional relationships, especially with China, Russia and the US. The paper suggests that India can no longer afford the luxury of non-participation. India will have to re-evaluate and re-calibrate its foreign and security policies by becoming pragmatic, realist, and resort to a mix of internal and external balancing through bi-lateral partnerships. It will have to demonstrate a mix of soft and hard power accompanied by political will to employ these instruments effectively. Japan wants to partner India and present a more robust front to limit Chinese activities. In furthering its relationship with an assertive Japan, India accrues the advantage of having strong relationship with an economically strong and influential partner and serves to counter-balance China when required. India's approach to its relationship with Japan will be steady and strong, however may not be at the pace that Japan desires. India will have to extend its geo-political influence, have good relations with all the players, manage its relationship with China while limiting or countering its influence. India must temper its relationship with Japan, calibrated with the considerations of its relationships with other countries.

## **SINO-US COMPETITION IN SOUTH EAST ASIA: OPPORTUNITIES AND CHALLENGES FOR BANGLADESH**

**Brigadier Syed Imran Raza Naqvi, TJ, nswc, ndc, psc**

Southeast Asia's position as a bridge between two oceans and also between the regions of the continent of Asia has lent it the distinction of being a point of convergence for Asia's rapid and resilient economic growth. A regional institutional architecture in the form of the Association of Southeast Asian Nations (ASEAN) has emerged in Southeast Asia that will help develop shared solutions to common regional and global challenges. Therefore, as the United States and a rising China shape the contours of the global arenas of politics, security and economics, Southeast Asia reflects a complex synergy in the relationship between the two titans.

In the case of the United States, US President Donald Trump has changed the way Asia looks at the country. The lack of interest expressed by a US administration focused on "America First" has deeply shaken its status in the region. In the

case of China, Southeast Asia is one of the most important areas for its foreign relations as relations with Southeast Asia determine the nature of China's overall foreign relations. However, Because of disputes China has in the South China Sea, tensions between China and Southeast Asian countries have grown in recent years.

Both China and the United States see Southeast Asia as important in its own right. Beijing and Washington are willing to exert considerable effort there to promote their interests. Southeast Asian hedging in the face of rising Chinese power is a common trend and the United States is well-positioned to benefit from this broad trend in the region. ASEAN's centrality gives Southeast Asian states some ability to set the agenda. The Southeast Asian goal can be to bring about some degree of political convergence so that both great powers will have a stake in preserving Southeast Asia's autonomy and promoting its prosperity. Bangladesh's geographical location between two major regions of Asia—South Asia and Southeast Asia—provides a unique opportunity for the country. In order to keep up with and take advantage of the ever-changing economic scenario fuelled by the Sino-U.S.-ASEAN link, Bangladesh needs to make effective inroads into the complex Southeast Asian environment. Regional partnership in and around the Bay of Bengal is expected to give desired dividends in all spheres, especially in economic and infrastructural development of Bangladesh.

## **EMERGENCE OF ARTIFICIAL INTELLIGENCE IN FUTURE WARFARE: PREPAREDNESS OF BANGLADESH ARMED FORCES**

**Lieutenant Colonel Nizam Uddin Ahmed, afwc, psc, Engrs**

Artificial Intelligence (AI) has been emerging as the revolutionary technology where machine intelligence is being developed to human intelligence. The future machines can think, decide, plan, act and learn from the environment. At present, the world is experiencing Artificial Narrow Intelligence (ANI) where machine can do only what it is designed for. But the transition of high speed processor, data storage capacity and compatible hardware have opened the door for Artificial General Intelligence (AGI). With the likely ride of 4th AI spring from 2018 to 2036, the trend of AI shows the footstep of intelligent machine that is predicted to act like a human by 2030 and cross sum of all human capacity by 2050. There is a 50% probability of AGI exposure in BD by 2030 when the exploration of AI subsets as Machine Learning, Deep Learning, Reinforced Learning, Computer Vision, Natural Language Processing, Crowd Sourcing and Human Support, Collaborative System, Internet of Things, Robotics and Swarming Intelligence are inevitable.



USA, China and India have been advancing their military AI technology by giving more emphasis on automated intelligence collection, large data interpretation, human-machine collaboration, unmanned platform, quantum technology, supervised & reinforced learning through neural network, image conversion, language processing, robotic framework and swarming technology. Inevitably, the future war will be changed by the faster analyzing of large data sets and human-machine collaboration with human and machine intelligence to facilitate decision making system to create more situational awareness by remaining connected globally. Protection, surveillance, cyber security and detection military fields got priority in order as opined by the surveyed members of armed forces of India, Nepal, Sri Lanka, Indonesia, Malaysia, Saudi Arabia, Nigeria, Niger and Uganda. 83% foreign respondents opined for shared AI research and development (R&D) to render maximum benefit to people in order of priority to financial, medical, educational, internal law & security, industrial and military defence system.

More than 60% respondents agreed that present state of AI applications in BD and BD Armed Forces need to be addressed. Priority of AI development has been set on surveillance, cyber security, detection and protection. The military experts identified that most of the upcoming equipment under Forces Goal 2030 are operated by ANI technology with the low extent of autonomy. But it lacks compatibility option with AGI. To acquire transition towards AGI technology, 53% respondents of BD Armed Forces opined that the forces do not have the right technical expertise for R&D. But, 68% respondents are confident that AI R&D can be established with cooperation and partnership with local engineering universities. 70% respondents emphasized that AI is a shared responsibility of government, military and stakeholders to provide the maximum potentials and value to the people and society by prioritizing the development of national requirement in order of traffic management system, defence system and law & order system. With the national AI policy and guidelines, the AI R&D fundamentals should develop cognitive AI algorithm keeping human-on-the-loop control system where human value is put on highest priority. The ethical guidelines should enforce accountability and responsibility by the concerned developer and authority of autonomous AI applications in a 12-year road map with the concerned stakeholders responsible for the development of cognitive AI algorithm. Leading techno giants can be invited to produce and develop compatible AI hardware with the military and local stakeholders. BD Armed Forces must take every endeavor to explore and emphasize our human intelligence capacities for the development of key AI subsets by infusing civil-military expertise to help prepare forces to explore the key military AI applications by 2030.

## **EFFECTS OF SOCIO ECONOMIC CHANGES ON FINDING QUALITY INTAKE OF OFFICERS FOR BANGLADESH ARMY: AN ANALYSIS AND WAYS AHEAD**

**Lieutenant Colonel Azaher Uddin Ahammed, afwc, psc, Inf**

Bangladesh Army is a well reputed organization both at home and abroad that has displayed a remarkable level of excellence and professionalism in all fields of employment. It is believed that, this is the ‘class of officers’ that made this difficult task possible as Bangladesh Army traditionally received an excellent set of officers. But recently, ‘downward trend in quality intake of officers’ has increasingly become a concern for Bangladesh Army, where many believe that the organization is gradually losing its relative attraction as a profession to the potential candidates due to the recent socio economic changes in the country. The research thus focused identifying effects of socio economic changes on finding quality intake of officers for Bangladesh Army.

A mixed method of explanatory and descriptive research using both primary - secondary and qualitative - quantitative data have been used for this research. The research identified that, Bangladesh has achieved significant socio economic development in last one decade. These developments have increased and diversified job opportunities in the country and changed the mindset of people. Young people now have much wider options to choose their career and as a result potential candidates, especially the quality candidates including their parents are increasingly losing their attraction for the profession. The data collected from Army Headquarters (PA Directorate) on initial application for regular courses indicates that the number has significantly reduced over years. The survey conducted on potential candidates and their parents clearly also revealed significant lower trend in the interest of candidates to join Bangladesh Army as officers, which might be causing a downward trend in the quality of officers’ intake. At the same time, the statistical findings from ISSB revealed that the number of quality of candidates, especially in terms of Socio Economic Status (SES)– one of the measurable indicators of personality development has reduced over time. As a result, due to the of reduced appearance of total candidates in the selection inlet and relatively lower turn up from better SES might be causing the general downward trend in the quality of officers’ intake. However both the reasons are likely to effects of recent socio-economic changes in Bangladesh that might have caused the relatively reduced attraction for the profession ‘Army Officer’.

## **‘ONE STOP’ HARDWARE ACQUISITION TREND IN BANGLADESH NAVY: CHALLENGES AND WAYS FORWARD**

**Commander K M Emon Rashid, (ND), afwc, psc, BN**

Naval platforms require spare parts for maintenance and serviceability of ships and crafts. Again, navies need to stockpile missiles and ammunitions to fulfill war time requirements. If we analyze the present trend of hardware acquisition, we find that Bangladesh Navy (BN) has acquired most of the hardware from a single country. This has led BN into single source procurement trend. Consequently, the broad objective of this study was to examine the present hardware acquisition trend for fleet development, address the challenges and explore possible ways ahead for Bangladesh Navy. The study found that the availability of cheaper hardware, budgetary constraint and lack of indigenous capability are the major motivating factors towards single source procurement from China. However, recent crisis with Myanmar and stand point of China eventually dictates that it is time to rethink capital purchase from a single source. In the process, it has been also experienced that, maintenance cost of Chinese origin ships are higher than that of British origin ones, due to requirement of more spare parts. It was also found that, operational availability of Chinese origin weapons and sensors are much lesser than that of western counterparts. Moreover, the impacts of present acquisition trend also encompass supply chain disruption, hindrance in indigenous capacity building, hampering security of sensors, arms race and overall quality of fleet. Furthermore, dependency on a single seller country will eventually allow that seller country to play pivotal role in time of crisis. Thus, considering the present and future impacts of one stop acquisition trend, BN should explore alternative solution while mitigating challenges. In the process of research, it has been experienced that, major challenges are requirement of increased budget, complicacy in design modification and price negotiation, increased training expenditure, difficulties in access to hardware and reduction of vacancies. However, through expert opinion and survey it has been seen that indigenous capacity building, joint venture, forming inter-governmental commission for technical cooperation and change of mind set along with acquisition of battle proven technology are key toward a pragmatic solution.

## **INADEQUACY IN OPERATIONAL EFFECTIVENESS; QUEST FOR A SOLUTION IN BANGLADESH PERSPECTIVE**

**Brigadier General Abu Sayeed Mohammad Ali, ndu, afwc, psc**

“Butter versus Gun” is an age old dilemma, especially in the developing countries like Bangladesh (BD). With the changing nature of threats, the effectiveness of

large standing Armed Forces are seriously in question. BD is no exception and being confronted with threat of different dimensions, originating from both external and internal sources. Constitution clearly states that “Safeguarding sovereignty and territorial integrity is the supreme and sacred duty of all citizens irrespective of cast and creed”. With all these, today policy makers are facing ever more challenges to develop an appropriate strategy to enhance elements of national power to protect vital national interests. In that context it is more complex to meet the adequacy in terms operational effectiveness of the Armed Forces. Core / Vital and other national interest is derived from aspiration of the nation. In short Core interest may be “Maintaining sovereignty and safe guarding territorial integrity” while the significant interest may be “Ensuring sustainable economic development and maintain human and energy security”. To safe guard or materialize these interest one needs to draw power from Geographic, Economic, Political, Military, National Will elements. On the other hand National power is heavily dependent on the national resources namely Natural, Human, Economic, Socio-psychological etc. BD will have to capitalize more on human resources for her development and enhancement of overall security. From constitution and other policy, it can be deduced that BD will be committed to resolve the contentious issues mainly by other means giving less preference to military option. Military option may be considered only if the core / vital interest is threatened and even then forces are likely to be employed in defensive posture within own territorial boundary. Thus it demands to maintain a credible and effective Armed Forces, which can duly complement to protect national interest.

Fighting power of any Armed Forces consists of Physical, Conceptual (Training and doctrine) and Moral (Ethics, Values and Ethos) component. Military service is unique and demands to maintain relatively higher ethical standard. Any Force being superior in physical and conceptual component will fail to generate its full fighting power if it lacks in ethical component. Modernization effort to focus to make the force to be the most effective one with deterrence capability. For defending own territory, people’s integration with military is likely to give more dividend. Finally it can be deduced that, an Armed Forces, which is morally upright having popular support can very professionally utilize their capabilities to effectively defend the motherland. But if devoid of ethics and popular support, same will fail to defend the motherland, it does not matter how big the Force is or how modern and developed it is.

# **BRACING ARTIFICIAL INTELLIGENCE FOR SOCIO-ECONOMIC DEVELOPMENT: OPPORTUNITIES, IMPLICATIONS AND CHALLENGES FOR BANGLADESH**

**Major General Md Wahid-Uz-Zaman, ndc, aowc, psc, te**

*“We always overestimate the change that will occur in the next two years and underestimate the change that will occur in the next ten.” - Bill Gates*

## **Introduction**

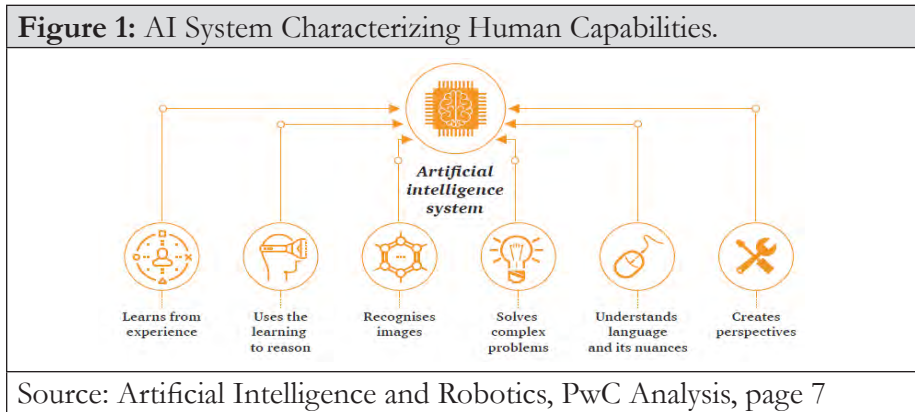
Concept of Artificial Intelligence (AI) dates back to the 1950s. However, interest in AI has been re-ignited over the last few years with an increasing number of real-world applications. It is a life changer and a complete disruptive force across technology, industry, market, employment, academic and economic dimensions and to the overall social matrix. It will create millions of new employments but will destroy thousands simultaneously as well. Countries across the globe, including our near and far neighbours, are investing heavily in AI innovations for development and sustainment in the competitive open market. AI benefits appear to be time sensitive and pioneer adopters may monopolize the opportunities in their favour. For Bangladesh also, AI applications have unending socio-economic opportunities. Timely adoption can significantly help in her divergent growth, while negligence may have adverse ramification. But there seems to be remoteness prevailing across the concerns of Bangladesh in realizing the importance and implications of AI. It is therefore imperative to study the socio-economic implications of AI for Bangladesh perspective. Unless value of AI is understood and potentials are braced, Bangladesh is likely to falter in achieving development goals, and be affected by the adverse AI fallout effects.

In light of above arguments, questions arise: what AI opportunities lay in front of Bangladesh for her socio-economic development? What are

the risks and challenges? How best she can adopt this technology? This paper principally seeks answer to these questions. In doing so, the focus will remain limited to three economic pillars of Bangladesh: agriculture, manufacturing and service sectors; and two dimensions of human resource development: education and healthcare. However, the author’s intention is not to find out a complete solution but rather to initiate a comparatively wider discussion within a defined boundary that can serve as a platform for others to study in vertical details.

## Defining Artificial Intelligence

The term “Artificial Intelligence” was mentioned for the first time in 1956 by John McCarthy during a conference who defined, “Artificial Intelligence is the science and engineering of making intelligent machines, especially intelligent computer programs” (PwC and ASSOCHAM, 2017, p.7). Nils (2010) attributes AI as making machines intelligent, Kaplan (2016) notes that AI is autonomous, can learn from their own experience and take actions accordingly. Interestingly, AI has been defined by many authors, but absence of a set definition keeps the AI landscape wider and helped the field to grow. Most significant qualities of AI are: it can learn from environment, decide, suggest action and solve problems as shown in Figure 1. It must also be noted that data is the food for AI. Internet of Things (IoT) makes better AI and AI makes IoT better useful.



## **A Glimpse of AI Adoption in Asia**

In Southeast Asia, current AI adoption rates stand at 14 percent. AI leader Singapore's government announced a national AI plan, AI. SG, to boost the country's AI capabilities (Indian Express Staff Report, 2018). In Vietnam, about 13.6% of enterprises have already invested in AI, choosing big data and cloud computing in the preferred list (Voice of Vietnam, July 2018). Neighbour Thailand started investing in AI research since 1988 and practical applications took off from 2011 (Kawtraku & Praneetpolgran, 2014). Meanwhile, Malaysia has revealed its national AI framework on 19 October 2017 (Bhunja, 2018). These countries believe that organisations that do not incorporate AI will soon lose out to their peers who brace it. In the Middle East, AI will contribute about \$320 billion to its economy by 2030. In a volatile oil-based economy, Arabs are welcoming AI to seek alternative sources for revenue and growth. UAE is poised to gain the most from AI, contributing 14% of the country's GDP. It is the first country in the world to appoint an AI State Minister (PwC, 2018, p 6). In the Far East, Japan has established a Strategic Council for AI Technologies in 2016 for developing AI research, education, skills and business. Its AI market is estimated to grow from \$33.48 Bn in 2015 to \$787.43 Bn by 2030 (EU-Japan Centre for Industrial Cooperation, 2015). China is aspiring to become the leading AI global hub, and is determined to overtake USA, not even a trade war will be able to stop it (Barhat, 2018). They account for 48% of global AI startup funding and their AI-led automation would add 0.8 to 1.4 percentage GDP growth annually (Barton et al., 2017). Meanwhile, South Korea aims to close the gap with China and reach within the global top four AI countries by 2022. Its R&D budget is 4.29% of her GDP, and plans to invest additional \$2 Bn on innovation (Peng, 2018). Our closest neighbour India has increased AI investment from 29% to 69% in last two years. It has recently formed an AI Task Force and opened up AI Institute at Mumbai. The government has made partnership with IBM and Microsoft in the field of agriculture and education. The AI Task Force is preparing India for the upcoming Industrial Revolution 4.0 and considers

manufacturing, entrepreneurship and product commercialization as top priority (Report of the AI Task Force, 2018). Examples referred above clearly manifest how concerned the major Asian countries are and the importance they attach in AI innovation. Bangladesh needs to learn from the neighbours lest they lag beyond catching up with the competitive world.

## **AI Opportunities and Implications for Bangladesh**

Economy of Bangladesh is based on three sectors: firstly, agriculture contributing about 14% of GDP engaging 47% of labour force; secondly, manufacture around 30% GDP with 13% employment and finally service sector contributing 56% GDP housing 40% of employment (CIA Factsheet, 2017). Meanwhile, human resources are the major drivers of growth to all these sectors. Thus, following paragraphs shall discuss in brief AI opportunities in above mentioned economic sectors including HRD.

**Agriculture and Aquaculture:** A study conducted by Prescient & Strategic Intelligence, reveals that the AI market size in agriculture was valued at \$110.3 mn in 2016, and is forecasted to advance at 23.2% compound annual growth rate till 2023 (P&S website, 2018). The increasing penetration of IoT devices in the agriculture industry is the key factor driving this growth. In applying AI in agriculture, ‘See and Spray’ robotic spraying system is very successful in eliminating weeds (Rakestraw et al., 2017). The Berlin-based agricultural tech startup PEAT has developed an application called Plantix that reportedly identifies soil deformity and degradation (Crunchbase official website, 2018) through user’s smartphone camera (Figure 2). The company claims that its software can detect pattern with 95% accuracy having a global client base over 500,000, including India. ‘Sky Squirrel Technologies Inc’ is using drone technology to improve their crop yield and to reduce costs (Kumba, 2017). Agricultural data derived from images captured by satellites and drones are analyzed by AI to detect diseases, pests, poor plant nutrition and crop yield prediction (Rakestraw et al., 2017). India in



partnership with IBM and Microsoft is assisting farmers to improve crop productivity, soil yield and predict the best time for sowing seeds with the goal of improving economy (The Economic Times, 2018). It has resulted 30 percent more yield, in Andhra Pradesh by analysing climate data from 1986 to 2015 (Microsoft News Center India, 2018). Coming to aquaculture, AI-based computer can count fish and identify their species with 100% and 75% accuracy respectively (Wilcox, 2018). One of the amazing technologies is eFishery, which uses sensors to detect the hunger level of the fish and can reduce feed costs by up to 21%. Biosensors such as Sensorex are helping to create efficiencies in the industry through the analysis of oxygen levels, balanced pH and water temperature; even heart rate can be measured.

**Figure 2: Determining Soil Quality by AI Based Application**



Source: Plantix Website (<https://plantix.net/> Date 12 August 2018)

Bangladesh's present population of 166 mn is expected to raise about 186 mn in 2030 (Population Pyramid, 2018). But her current 8.5 mn hectare cultivable land is shrinking at a rate of about 0.73% per year. It still lags in crop yield efficiency compared to other Asian countries (Table 1). Rapid urbanization and unpredictable climate change add fuel to the problems. Bangladesh needs to find ways to ensure food security of the millions, and AI can certainly assist. AI technologies can be used in identifying

soil deformity and nutrient deficiencies, weed elimination, reducing and nutrient deficiencies, weed elimination, reducing use of pesticides, crop monitoring, classify plant pest, forecast rain, determine plants’ water need and best time for sowing seeds etc. AI-guided drone and images captured by satellites can assist to the overall farming techniques. Similarly in aquaculture, AI technology can be used in counting and determining fish size to avoid premature catching of ‘Hilsha’, detect hunger level of fishes and feed them accordingly; and analyse oxygen, pH value and temperature of water for better shrimp production. However, development of AI algorithms can be challenging because of the high cost of cutting-edge AI technology, lack of expertise, collection and extensive pre-processing of data before it can be reliably used as input.

Serial	Country	Paddy Yield Ton/hectare (2014)
1	Japan	6.70
2	China	6.5
3	Vietnam	5.75
4	Indonesia	5.13
5	Bangladesh	4.42

Source: Ricepedia at <http://ricepedia.org/>

**Manufacturing and Service Sector:** In manufacturing, human free productions are getting momentum with simple economic aim of getting better products at low cost to maximize profit. Amongst pronounced AI innovations, driverless transport is gaining increased attention promising huge potentials. 3D printers are used for large scale building construction, resulting better and low cost homes for the modest income groups, but may eliminate many jobs as well. AI led smart Dubai strategy aims to construct 25 percent buildings using 3D printing and run 25 percent driverless transports reducing 12 percent accidents by 2030 (PwC, 2018, p 6). Globally automation could raise productivity growth by as much as 0.8 to 1.4 % annually (Manyika et al, 2017). To identify automation potential

of different sectors, World Economic Forum conducted a study across 800 occupations, which suggests that almost half the activities have the potential to be automated by adapting currently used technology (Table 2). Meanwhile it is estimated that AI enabled global business will reach to 3.9 Tn by 2022 (Gartner Newsroom, 25 April 2018), and AI will help in marketing, supply chain management, business continuity and risk management.

<b>Table 2: Sectoral Automation Potential</b>		
Serial	Sectors by Activity	Automation Potential (%)
1	Accommodation and Food Service	73
2	Manufacturing	60
3	Agriculture	58
4	Transport and Warehousing	57
5	Retail Trade	53
6	Mining	51
7	Other Services	49
8	Construction	47
9	Utilities	44
10	Wholesale Trade	44
11	Finance and Insurances	43
12	Arts, Recreation and Entertainment	41
13	Real Estate	40
14	Administrative	39
15	Healthcare and Social Assistance	36

Source: A future that works: Automation, employment, and productivity. McKinsey Global Institute, New York, 2017, Page 7

**Data is the Food for AI:** Many companies across the globe are exploring alternative data coming from sources like cellphone signals, IoT sensors on industrial equipment, online videos, social media likes and satellite images. The market for alternative data was about \$200 million in 2016

and is expected to shoot to more than twice by 2020, which shall create jobs nobody even thought of before (Maney, 2018). As for jobs, a study by tech analyst firm Gartner concluded that by 2020, AI will automate 1.8 mn people out of work but will create 2.3 mn jobs - a net gain of 500,000 jobs. Deloitte, another consulting firm, studied automation in the United Kingdom and found that 800,000 low-skilled jobs were eliminated because of AI, but another 3.5 mn positions were created with better pay than before (Maney, 2018). Thus, AI is likely to create a lot more new employments than it shall kill.

In manufacturing, Bangladeshi industries are human intensive. Its markets are flooded with Chinese products. Global AI aided automation will produce better products at lower cost, impacting the markets further. Sectoral automation potential as identified at Table 2 is both a blessing and threat to Bangladesh. Meanwhile, in Bangladesh, at least 25,120 people died and 62,482 people were injured in road accidents between 2015 and 2018 (Prothom Alo, 4 August 2018). Driverless transports though shall create unemployment, appear to be a better alternative in near future to reduce accidents. Similar argument is applicable for constructing economic house by 3D printing also. For AI enabled new jobs maximum opportunities for Bangladesh are in the software industries, especially alternate data has huge potentials. Opportunities are abundant, Bangladesh needs to reskill, upskill and adapt to the changing technology needs. However the importance of time advantage must not lose sight before it is too late to recover.

## **AI in Education Sector**

AI in education is increasingly used as a tool for better learning and also as a discipline of study. As a learning facilitator, AI powered 'Presentation Translator' supports 60 languages and allows students to understand contents in their own native language (Microsoft Garage. 2018). Seeing AI App is largely developed by a blind employee of Microsoft, gives diverse assistance to visually impaired students (Microsoft Seeing AI, 2018). Intelligent tutoring system such as Carnegie Learning can work with students directly and

facilitate teaching (Schmidt, 2017). Matthew Lynch (2017) suggests at school level, cloud based AI can predict probable school drop outs with reasons and recommends preventive measures, as was done in India by the Andhra Pradesh Government in 2017 to identify about 19,500 probable drop outs in the next academic year (Arora, 2018). AI powered 'Gradescope' makes assessment of assignments a lot speedier, saving 70 percent or more time and providing a detailed analysis of the students' performance. AI chatbot can communicate with students in place of a teacher without students knowing that they are not talking to a human teacher. 'Thinkster Math' uses AI to determine how students learn and comprehend math concepts so they don't fall behind. Furthermore, admission processes can also be streamlined and improved, reducing the workload for high volume admissions offices and teachers. It is accepted that AI shall take on more of a teaching role and teachers will move into the role of learning motivator.

Rapid growth of AI in multiple sectors needs huge number of expertise with relevant skills and knowledge. Appreciating the need, Thailand started teaching AI at government universities more than 30 years ago with the first AI laboratory at the Kasetsart University (Christopher, 2018) in 1992. China identified a talent gap of more than 200,000 workers in industrial robotics applications, with a projected increase of 20-30% annually. They have included discipline like Industrial Robotics, Industrial IoT applications, Industrial IoT Engineering and Smart Product Development to offer major vocational degree programs (He, 2017). Globally, Data Science, Machine Learning, Neural Network, Deep learning etc are the most common domains of AI education. Julia, invented by MIT Professor Alan Stuart Edelman, is the preferred programming language to work with AI.

For Bangladesh literacy rate has significantly increased in last few decades; however, quality remains highly questionable. For example, foreign currency earned by about 10 mn Bangladeshi expatriates is almost drained out by about 0.3 to 0.4 mn foreigners employed in Bangladesh, because they are better qualified. RMG sectors are employing thousands of foreign 'super mangers'. Vocational training is only 10% of education curricula,

compared to 60% plus in Singapore and Germany. Bangladesh Education Statistics-2015 shows 40.29 percent of the secondary students dropped out in 2014 (Daily Star, Staff Report 2016). These indicators show, Bangladesh needs to boost her education quality and prepare the youths to brace the benefits of technology. AI powered tools can be examined, explored and gradually adopted at different education levels of Bangladesh. However, many of these are to be compatible with Bangla language also, which demands research. Most importantly our education system shall need an extensive overhaul to be able to brace the benefits of AI.

## **AI in Healthcare**

AI is bringing a paradigm shift to healthcare, and according to Frost & Sullivan, globally healthcare AI revenues are estimated to reach USD 6.66 billion in 2021, up from USD 633.8 million in 2014 (Langen et al., 1994). In diagnosis and early detection, IBM's Watson for Oncology is now being used around the world, including 21 hospitals across China, Thailand and India, with 99% accuracy in cancer detection. AI techniques have also been used for early stroke prediction, diagnosis, treatment, as well as prognosis evaluation (Jiang et al., 2017). Cyrcadia's iTBraTM is a wearable vest being used for detection of breast cancer at earlier stages. AI can remotely monitor heart irregularities (Sennar, 2018) and translate mammogram 30 times faster than human with 99% accuracy (Arnold & Wilson, 2017). Malaysia is using AI in predicting and preventing dengue outbreaks (Poskod, 2018). They have also developed an AI-based system that interprets sign language and converts it into text (Indian AI Task Force Report, 2018). In surgery, Da Vinci Surgical Robot is a major innovation, which helps surgeons be more precise and to remove natural hand tremors during surgery (Svete et al., 2018). AI based robots can assist the elderly patients, disinfect hospital facilities using UV light and draw blood faster and more safely than a human. Oxford's AI lab has developed lip reader software to help speech-impaired to communicate. KASPAR is a child-sized humanoid robot designed to help teachers and parents support children with autism (Arnold & Wilson, 2017).

In Pharmaceuticals, AI division at the Johns Hopkins University focuses on drug discovery programmes for cancer, Parkinson's, Alzheimer's, and other ageing and age-related health issues. Atomwise found two drugs – reportedly in one day using its AI technology – that work against the Ebola virus (Arnold & Wilson, 2017). In managing medical data and records AI-enabled robots collect, store, re-format, and trace data to provide faster, more consistent access (Novatio, 2017). This equates to a work time savings of 17 % for doctors, and 51 % for registered nurses (Collier et al., 2017). IBM Watson can review and store every medical journal, symptom, and case study of treatment around the world – exponentially faster than any human, and is capable of finding evidence-based meaning even eliminating misdiagnosis (Arnold & Wilson, 2017).

In the health sector, though life expectancy of Bangladeshi people has increased over 71 years, but the overall healthcare system remains significantly poor even compared to our neighbours. Bangladeshi patients spend \$2.04 Bn annually on healthcare abroad, which is 1.94% of the country's total GDP (BIDA, 2017). Noting the innovations like: health monitoring, diagnosis, surgery, treatment, record management, aiding disabled etc Bangladesh healthcare can significantly benefit from AI adaptation. To add further, Bangladeshi pharmaceutical products export revenue earning for 2016-2017 was USD 131.17 mn with a growth rate of 24%. Market almost doubled in last 5 years and is expected to be doubled in next five years as well. If Bangladesh wants to remain competitive in the global pharmaceutical sector, embracing AI can help considerably. However, although the AI technologies are attracting substantial attentions in healthcare, the real-life implementation is very challenging because of collection and processing of data, absence of policy, lack of trained manpower and finance.

## **AI Threats, Challenges and Strength – Bangladesh Perspective**

Unemployment is the major AI threat for Bangladesh, specially affecting the employment and export earnings by the RMG sector. Transport,

construction, call centres, low skill and structured jobs shall face the significant cut. World Bank predicts automation threatens 69% of the jobs in India and 77% in China (The AI Task Force Report, 2018). Globally 800 mn jobs will be taken over by AI threatening Bangladesh as well. AI will raise the premium placed on digital skills while reducing demand for medium and low skill workers, potentially exacerbating income inequality. It will also create a digital divide amongst nations, led by advanced countries. Bangladesh is likely to lag behind significantly in this AI power race.

As for challenges in adopting AI in Bangladesh, first comes adapting to new kind of jobs. AI is constantly changing nature of jobs, so are the need for requirement of skills, reskill and upskill. The most important challenge for Bangladesh will be to manage AI-related data in terms of collection, collation, validation, storage and distribution/exchange without compromising security, privacy and ethics. But the greatest limitation Bangladesh has is the acute deficiencies in AI expertise and knowledge. It does not have any AI institute and training curriculum like that of China, India and other countries of Asia. It is further aggravated by insufficient and focusless research and innovation. She ranks lowest in Asian countries in 'Global Innovation Index 2018' (Global Innovation Index website), even behind Pakistan and Nepal. Her R&D is not result oriented and intellectual outputs are not realized into economic growth. Bangladesh is yet to formulate an AI policy; it has huge gaps in public private partnership and its home-grown infrastructure needs considerable attention to facilitate adoption of AI benefits.

Bangladesh's principal strengths are her economic development, digital base, tele-connectivity, and an intelligent and innovative young demography. ICT Division of the Ministry has started taking visible initiatives and is rendering support to the entrepreneurs. Cases in point are 'iDEA Project' and 'IoT Army of 300'. In the private sectors, individual and small business identities are investing in AI with noticeable success. AI club called 'Jumpers' has been established in Dhaka under the guidance of Professor Jamilur Reza Chowdhury that works on Julia language, 'eGeneration Ltd'



is one of the frontier companies, has recently signed an agreement with a Dubai based company to provide AI based service (eGeneration website, 2018). ‘BloodBot’ uses geolocation functionality for tracking blood donors. ‘Bengali. AI’ is working on Bangla data set. ‘Augmedix’, with office at Panthapath is providing prescription writing and health record service to the Doctors in USA. However, an organised holistic approach is yet to be taken, and a centralized data repository seems absent.

## **Principal Recommendations and AI Adoption Strategy for Bangladesh**

**Policy Response and Forming an AI Task Force:** Formulating right AI policy can play a significant role in shaping the direction and effects of AI innovations. The regulatory framework must be liberal to welcome private initiatives and encourage investment. Bangladesh must also immediately form an AI Task Force under the aegis of ICT Division. Members from other line ministries, A2i project, academia, industries and service sector are to be included like that of India. Few terms of references for the Task Force, but not limited to, may be:

- Identify and prioritize probable areas where AI can help in development of Bangladesh.
- Identify probable areas where government intervention and assistance is necessary.
- Identify probable areas where public-private partnership shall be better suitable for AI-based development.
- Propose an AI implementation roadmap for Bangladesh.
- Propose a coordinating organisational structure to coordinate the national AI initiative.
- Propose an AI policy.

**Education and AI Innovation:** Bangladesh needs to formulate an AI Education Strategy to develop human resource with necessary skills, re-

skill or up-skill and given the opportunities for lifelong learning. This should identify a target number of expert required on a yearly basis on each AI domain. This also includes AI-related curricula for school, college, diploma, graduate and post graduate with a focus on sector specific skill. Dedicated AI institute is to be set up and vocational training curricula must be substantially reviewed to include industrial AI education. In addition, Bangladesh must substantially increase interdisciplinary research financing, from her current investment of less than 0.1 percent of GDP in R&D for AI innovation. Most importantly AI initiatives must tie up the educational institutions with the industries for translating talents into economic growth.

**Data Management and Policy Formulation:** Creation of an interdisciplinary large Data Center for aggregation and interpretation of data generated is of unconditional necessity. With requisite sharing related regulations, ensure availability of cross-sectoral data for re-use, such as the data held by the Election Commission, mobile operators, academic institutes, different Ministries, healthcare centers, agriculture and financial institutes etc. To take full advantage of the data benefits, formulating a comprehensive data policy by the Ministry in coordination with BTRC is of utmost importance.

**Support Private Initiative:** Government must support private initiatives by taking the seat of a facilitator and avoid getting involved in implementation. It should learn from the mistake of Kaliakoir High Tech Park and let the private sector to work freely. Indian Wadhvani Institute for AI is a good example and South Korean investment of \$ 8490 million in public-private AI innovation partnership spanning over six corporations is to be noted as well.

**Recruit Global Talent and Seek Bilateral Cooperation:** To make a firm AI base, Bangladesh needs to recruit global talents to conduct AI research and establish start-up companies at home. There are many Bangladeshi talents working abroad who may be encouraged to work back in Bangladesh with appropriate support as has been done for the jute genome research. ICT Division supported by Ministry of Foreign Affairs may take the lead.

**Awareness and Encouragement:** Basic condition to effect a change is that acceptance by all concerned that a change is necessary. Policy makers, academicians, industrialist, manufactures, business society and common users must understand how AI and robotics have the potential to work for and be beneficial for their interests. ‘Digital Bangladesh’ should gradually transit to ‘AI Bangladesh’. In addition, convening talent conference and announcing national award for creative contributions in AI shall motivate the mass. Moreover it is important to form robotic society in our country, like: Robotics Society of Japan, India, Korea, UK etc.

**Enabling AI Based Sectoral Development:** In addition to the recommendations and suggestions noted above, followings are a few sector specific propositions to enable AI-based growth.

- **Agriculture and Aquaculture**

- Agriculture sector had 21.79% export growth in 2017-18 (Prothom Alo, July 2018). Moreover, Bangladesh is the 4th largest sweet water fish producer in the world. By 2025 global demand of sweet water fish will rise to 150 million metric tons more. Using AI, Bangladesh must seize the opportunity to increase agro and aquaculture productivity and diversify her export sector and create opportunity for employment.
- Research, innovation and financing of AI system for crop yield, soil health determination, weed controls, pesticide use, weather prediction etc.
- Develop infrastructure for collection, validation and storing data and access to it.
- Manpower training on use of AI system.

- **Manufacturing**

- Introduction of hybrid man-machine team working together to improve productivity, with appropriate safety measures.
- Setting up industrial Internet connecting network of machines, products, robots, sensors, humans etc for collection of data and intelligent automation. Also lay down standards to exchange data amongst them.
- Manufacturing and business process transformation through AI, especially in SME.
- Quality through AI-based predictive maintenance and early fault detection.
- HR development to acquire new skill, upskill and re-skill for adaptation with new jobs and compensate loss of employment.
- Tax incentives to the AI based manufacturers and reduced price to the users.

- **Service Sector**

- Collection, processing, validation, sharing and trade of data under appropriate policy cover. Provide off-shore service from Bangladesh, like data export and healthcare service to the aged people of advanced countries.
- AI-based logistics and supply chain management, example warehouse management.
- Improve delivery of AI-based public service like water, gas, energy etc.
- Service mapping of different ministries, corporations and utility sectors to better coordinate and provide improved services to the public.

- **Education**

- Teachers training in developing and imparting tech-enabled solution like Chatbot, Think Master, AI Translator etc.
- Make technologies accessible to all education institutes and deploy them in ‘teacher-student-technology’ collaboration method.
- Extensive introduction of AI-supported online courses without human assistance, especially in skill up-gradation and retraining.
- Employ feedback driven teaching-learning process like ‘Byju’s learning App’.
- Introduce AI enabled courses to develop communication skill and collaborate in global village.
- Use AI to minimize school drop outs.

- **Healthcare**

- Study and introduce Malaysian model of AI based Dengue diagnosis and treatment.
- Study Indian model of AI based healthcare support to the marginalized people.
- Introduction of AI enabled healthcare to the aged, blinds and autistics.
- Introduce AI-based diagnostic system especially for early detection of cancer.
- Gradually adopt surgical robots with appropriate human support.
- Training of physicians and healthcare personnel in collaborative working with AI.

- Data collection, analysis, archiving and availability at all level.
- Management and ethical use of health data through policy and regulation.

## Conclusion

“Technology - no matter how well-designed – is only a magnifier of human intent and capacity. It is not a substitute.”- Kentaro Toyama

Successful adoption of AI will depend on three factors: people, process and technology. AI adoption shall grow faster if people realize the benefits and accept the technology, understand their technical know-how and apply the process objectively. However, given Bangladesh’s education quality, technology use culture, social and economic parameters it is important that AI development should proceed with minimum social and economic disruption, while carefully noting the concerns for loss of jobs of the less skilled employees. In doing so, the government, industry, academicians, civil society and people of all walks need to work in synergy to make the best use of AI opportunities to help Bangladesh in her socio-economic development and achieve the target to become a developed nation by 2041.

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## **Author**

Major General Md Wahid-Uz-Zaman was born on 10th January 1967 and was commissioned in the Corps of Signals on 25th December 1987. Besides his usual regimental appointments as Adjutant and Company Commander, he commanded a Signal Battalion as a Lieutenant Colonel and the only Independent Signal Brigade of Bangladesh Army as a Brigadier General. As Staff officer, he served as GSO-3 Operations in an Infantry Brigade, GSO-2 in Signal Directorate, Deputy Military Secretary at Military Secretary's Branch and GSO-1 at Military Operations Directorate at AHQ. He also served as Colonel Staff of an Infantry Division. He is a graduate from Staff College Mirpur. He attended number of courses at home and abroad including Electronic Warfare Course at Egypt and War Course at NDC, Pakistan. He has obtained Telecommunication Engineering Degree from JNU, India, Masters in Defence Studies from Bangladesh and Masters in War Studies and Defence Management from Pakistan. He has served in UN missions in Congo as an Observer. The General visited many countries across the globe including USA, UK, Australia, China and India. General Wahid passes his leisure in reading and golfing.

# IN QUEST OF A CONDUCTIVE DEMOCRATIC ENVIRONMENT TO SECURE PEOPLE'S RIGHT IN BANGLADESH

**Brigadier General Abul Fazal Md Sanaullah, SUP, hdmc,  
ndc, psc**

*“To be free is not merely to cast off ones chains, but to live in a way that respects and enhances the freedom of others.” Nelson Mandela in ‘Long Walk to Freedom’*

## **Introduction**

‘Democracy’ and ‘rights’ are intertwined constructs - inherently embody self-determination, dignity and liberty. ‘Democracy’ is one of the four fundamental principles of Bangladesh’s constitution which bestows all power of the republic to its people (Article 7.2). ‘Rights’ too, have been comprehensively held in the fundamental policy (Part II) and Fundamental Rights (Part III). Drawing strength from the constitution, Bangladesh has adopted almost all relevant UN conventions and protocols related to universal human rights.

Bangladesh is a fairly young democracy. Its progress has followed an uneven path - compounded by undemocratic interventions, economic imperatives, low social capital, and, deficient political consensus. Indeed, these, along with historical and socio-economic factors, have impinged and moulded the democratic environment, as also the sphere of ‘people’s right’. The interface and interplay between democratic environment and people’s right - is intricate, interdependent and dynamic. Diagnostics of one can help gauge the quality of the other. Notwithstanding the long strides made by Bangladesh, it is assumed that the country has to do more, and do it consistently, to shape an environment envisioned in the constitution.

## Evolution of Democracy and Rights and Relevant Context

### Interface between Democracy and Rights

**Democracy:** There are varying definitions and notions of democracy. On the afternoon of 19 November 1863, standing sombrely on the ruins of Gettysburg, victorious Abraham Lincoln - the political leader of the Union, recalled the sacrifices and stressed on the perpetuity of self-determination and freedom. He quoted from John Wycliffe's prologue - the following passage: 'government of the people, by the people and for the people...'. Ever since, this has become a buzz and a popular notion of what is meant by 'democracy'. Going long back in history, one good anecdote comes from the great Greek statesman Pericles, whom Thucydides hailed as the 'the first citizen of Athens'. Pericles stated:

“Our constitution is called a democracy because power is in the hands not of a minority but of the whole people...everyone is equal before the law;... what counts is... the actual ability which the man possesses. No one...is kept in political obscurity... And, just as our political life is free and open...we are free and tolerant in our private lives; but in public affairs we keep to the law.” (Harris, E.M. quoted in Khan, 2017)

Almost similar, yet structured contemporary interpretation of democracy is: an open and accountable government based on free and fair election, and, civil and political rights.

Apart from the above, three distinctions espoused by S.E. Finer are also central to democracy: firstly, a government derived from public opinion and being accountable to it; secondly, this public opinion, it is presumed, is freely expressed; and lastly, in the matters of contention between sections of public opinion, it is the majority opinion that prevails. (Finer, 1997)

**Rights:** Like democracy, 'right' is also quite intangible. “Natural scholars” conceive human rights as given; “deliberative scholars” as agreed upon; “protest scholars” as fought for; and “discourse scholars” as talked about.

(Dembour, 2010) Historically, the protest scholars' view of 'right' being a measure of achievement through struggle – is better substantiated. Legendary leaders including Abraham Lincoln, Mahatma Gandhi, Nelson Mandela, Martin Luther King, and, Bangabandhu Sheikh Mujibur Rahman have led the fight to achieve the 'right' – both 'human' and 'political'. 'Natural', 'deliberative' and 'discourse' schools are more relevant in environments that are stable and matured.

**Democracy-Right Association and Expanse of Rights:** UN has endorsed the “mutually supportive and symbiotic” relationship between democracy and rights. (UN OHCHR and IDEA, 2013) In so far the provisions are concerned, UN's 'International Bill of Human Rights' (IBHR) is comprehensive and all-encompassing. Originally, it included the 'Universal Declaration of Human Rights' (UDHR, 1948) only. Subsequently 'International Covenant on Civil and Political Rights' (ICCPR, 1966) and 'International Covenant on Economic, Social and Cultural Rights' (ICESCR, 1966) also formed part of IBHR.

## **Evolution of 'Democracy' and its Inclination to 'Rights'**

**Prehistoric Antecedent:** What was life like before people learnt to live in societies? Thomas Hobbes calls the life as 'natural condition of mankind' or 'state of nature'. This life, he says, was 'solitary, poor, nasty, brutish and short' (Press, 2013) Free yet unruly, deficiencies eventually led the tribal and hunter-gathering people to find unity in respective confines. To some, this was first sign of direct democracy. (Dahl, 1956). Major inference from the prehistoric anecdote is: direct democracy was a feasible option in a small group but could not address gradually expanding societies with varying capacity.

**Athenian Origin of Modern Democracy:** By the most widely held tenet, modern day 'democracy' owes its origin to Greek City States (known as a polis) that embraced direct democracy in 507 BCE. 'Democracy' was coined from the word *dēmokratīā* - epistemologically meaning 'people' (demos) and 'rule' (kratos) or 'rule by people'. Greek philosophers at the

time espoused many political philosophies. Plato outlined five different forms of governance in order of preference, namely: aristocracy, timocracy, oligarchy, democracy and tyranny. He favoured ‘aristocracy’ or rule by ‘philosopher king’- an ‘enlightened despotism’. Plato was critical about democracy, for he feared ‘majority tyranny’, ‘excess’, and, ‘lack of restraint’. (Russel, 1917). Contrary to Plato, his disciple Aristotle, favoured ‘middle class polity’. Interestingly, none of them favoured all-inclusive democracy yet. Aristotle distinguished governance into six different forms based on the size of ruler (individual or group) and the quality of governance. His topology is given below:

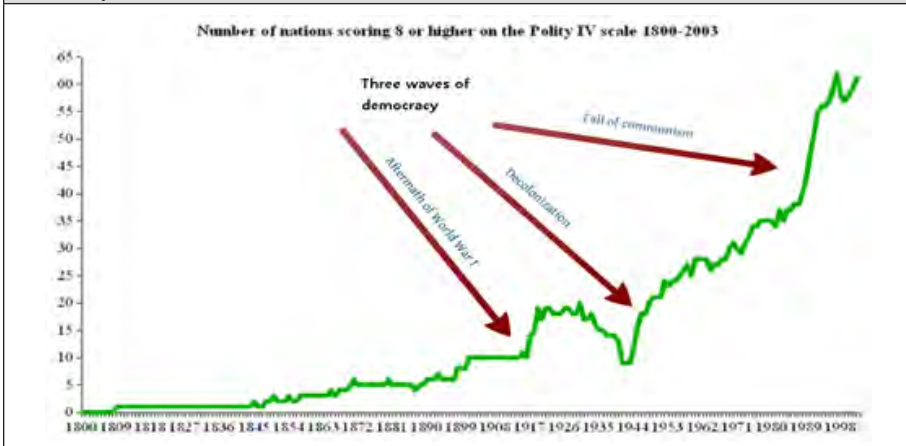
<b>Table 1: Aristotle’s Topology of Governance</b>		
Governance Size (Ruler)	Ideal Quality	Perverted Quality
One	Monarchy	Tyranny
Few	Aristocracy	Oligarchy
Many	Polity	Democracy
Source: Compiled from the Narrative at Russel, B. 2013		

From the time of Aristotle, the debate on ‘Democracy’ (government by the people), Aristos (government by the best) and Oligos (government by the few), kept brewing.

**Modern Evolution:** There were many medieval evolutions in Europe. The English Magna Carta, adopted in 1215, was a defining documents to subjugate all to law – including the king. It followed the formation of English Parliament – arguably the starting point of English democracy. Through the next centuries, slowly but surely, Europe started to adopt pro-people institutions. The demand was manifested in renaissance. Meanwhile the evolution across Atlantic was equally important. On 4 July 1776, 13 American Colonies declared independence from Great Britain. The declaration was premised on: equality and unalienable right of human; life-liberty and happiness; peoples’ representation in governance; and; reflection of peoples’ will. In over a decade time, these would be incorporated in the ‘bill of rights’ and would be inferred around the world.

**20<sup>th</sup> Century Evolution:** 20th Century is arguably the golden era for democratisation. Three mega events: the World War I, World War II and the Fall of Berlin Wall, contributed to it. Allied victory in the World War I delegitimized non-inclusive governances of monarchy, oligarchy and aristocracy. The World War II exposed the fallacy of fascism. Colonialism also lost relevance. Dismemberment of the Soviet Union in 1990/91, signalled near-end to communism. Given in the Figure 1 is the pattern of growth of democracy over two centuries, 20th Century in particular.

**Figure 1:** Growth and Proportion of Democracy over 19th and 20th Century



Source : Polity IV cited in Wikipedia (Polity IV, 2017)

**Major Inferences from the Evolution of Democracy:** The short chronicle of democratic evolution underpins basic features of democracy and its interface with ‘rights’. These features include representation, free will, majority decision, liberty, and, freedom. Democracy has become universal and liberal. From a bare 10% in ‘Athenian’ time, world has come to accept universal suffrage in the 20th Century. ‘Liberty’ and ‘democracy’ – two independent streams of notion have merged through the quake of WWII and assumed the term ‘liberal democracy’ – a synonym of ‘democracy’ today. (Mozumder, 2018)

## Contemporary Democratic Discourses

### Majority-Minority Discourse and Inclination towards Proportional Representation

The important question facing democracy is: how to play the ‘majority rule’? A democracy has to evade ‘majority tyranny’ yet reflect the majority will. Of late, proportional representation is gaining increased ground and is being exercised in 87 democracies, in some form or the other. This is to offset the limitations of ‘winners take all’ model. This view rationalises from the erroneous representation in the ‘winner-take-all’ models as captured in the table below:

<b>Table 2: Game of Number in a ‘Winner-Take-All’ Model</b>				
Country and Incumbents	Election	Vote (Percentage)	Seats (Percentage)	Remarks
UK (The Conservatives)	2015 General Election	36.9	50.61	
	2017 General Election	45.6	55.92	Interim Election
Canada (Liberals)	2015 Federal Election (42nd)	39.5	54.44	
India (BJP/ NDA)	2014, Lok Sabha	31.34/38.5*	51.93/61.88	*Lowest percentage by the incumbents since independence
USA (Republican)	2016 Presidential Election	Despite 2,864,974 votes lesser than Hillary Clinton, Donald Trump got elected by the Electoral College		



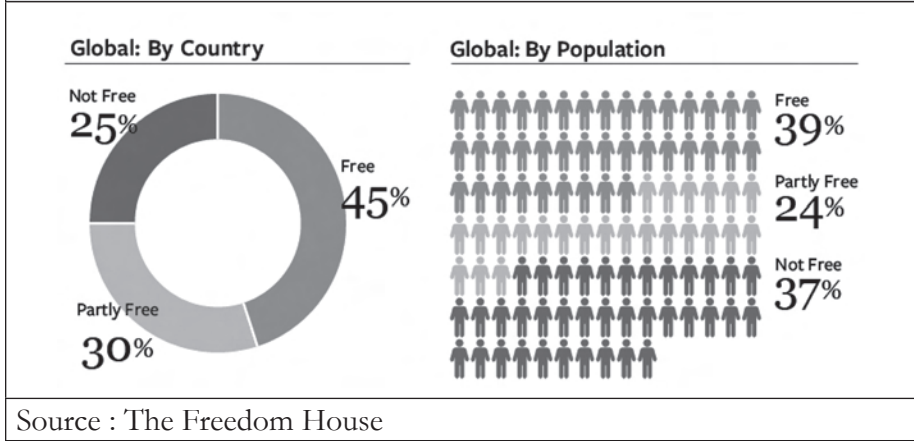
<b>Table 2: Game of Number in a ‘Winner-Take-All’ Model</b>				
Country and Incumbents	Election	Vote (Percentage)	Seats (Percentage)	Remarks
Bangladesh (Different parties)	1991 (5th)	30.81	46.67	Nearest 30.08/29.33
	1996 (7th)	37.46	48.67	Nearest 33.60/38.67
	2001 (8th)	41.40	64.33	Nearest 40.02/20.67
	2008 (9th)	49.00	76.67	Nearest 30.20/10.00
Sources : Khan 2017; Election Commission, Bangladesh, n.d; Election Canada, 2015; Federal Election Commission, USA, 2017; Election Commission of India, 2014.				

To the critics, popular support in ‘winners take all’ is often misrepresented, and therefore, lacks in inherent strength. (Sterling, 1981) Inherently therefore, study shows that, as per the 2017 Democracy Indexing of 167 countries, 9 out of the top 10 democracies were from the proportional representation type, whereas there are only 3 remained in the bottom 20. ‘Winners take all’ is not doing well at all. (The Economist, Intelligence Unit, 2017)

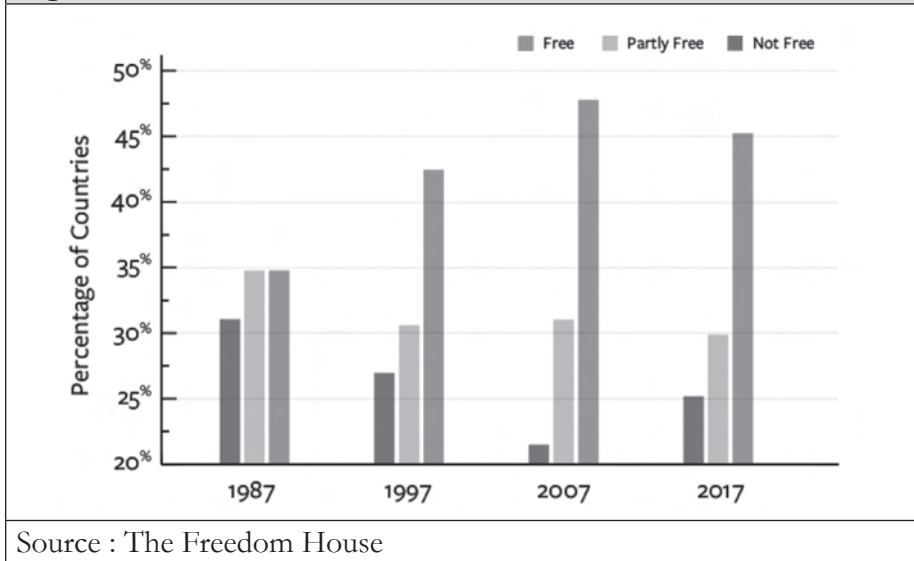
## Democratic Decline

Despite exponential growth of democracy in the latter half of the 20th Century, the recent decade is showing worrisome signs of decline as seen in Figure 2 and 3. The proportion of free people has dropped by staggering 7% in last 12 years since 2006. (Stavridis, 2018 citing Freedom House) No wonder, the global average indexing has dropped to 5.48 in 2017 from the 5.52 in 2006. (Economist Intelligence Unit, 2018)

**Figure 2: World Freedom Status 2018**

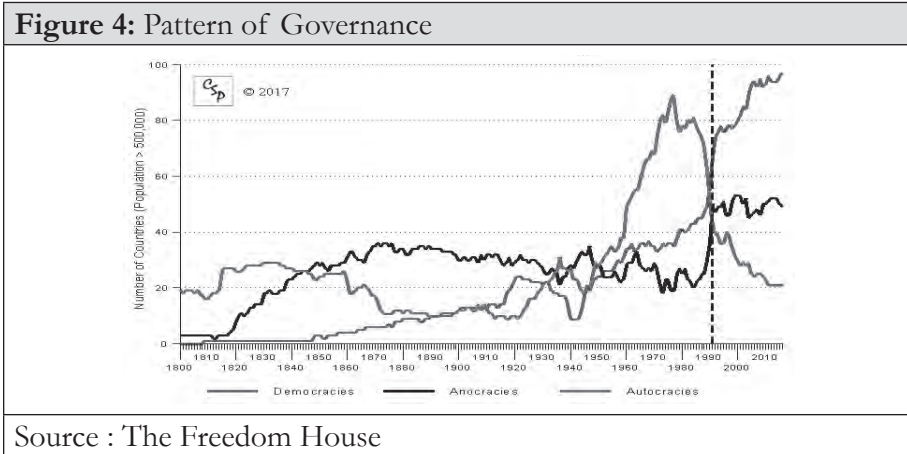


**Figure 3: World Freedom in Balance**



Freedom House portrays a complex governance trend since 2000. There is a decline in both democracy and autocracy. Instead, anocracy, a synonym for a hybrid mix of democracy and dictatorship, is growing steadily. (Figure 4)

**Figure 4: Pattern of Governance**



Source : The Freedom House

## Context Asia: Post-Colonial Political Clout

Rounaq Jahan mentions that, with few exception, Asian democracies in general, suffered from some deficits in the post-colonial era. Hangover still persists. These deficits include lack of appetite to defeat in election, lack of tolerance to dissent and opposing views, ‘privatisation of institutions’ and civil-military bureaucratic interventions. This trend, she observes, is quite perpetuating. (Jahan, R. 2018)

## The Bangladesh Context

### Historical, Cultural and Geographical Legacy

**History:** At independence, Bangladesh did not inherit democratic institution of note. Historically, in a ‘patron-client’ political equation with the British, Hindu Rajas enjoyed patronage and the Muslims were often subjected as clients. Democratic institutions of Pakistan were thus less apt than India to begin with. During the Pakistan regime, democratic space was painfully shrunk and institution-building remained a far cry. At independence therefore, Bangladesh’s democratic institution had to start from the scratch.

**Culture:** Bengali culture boasts of empathy and resilience. However, some characteristic qualities are not so lofty. Most evident being ‘envy’ and ‘lack of cohesion’, as reflected by the Father of the Nation in his Unfinished Memoir (Rahman, 2012). Swinging allegiance, self-serving nature, and, deceit - are some of the other characteristics that explain lack of unity. (Khan, 2017).

**Frontier:** Willem Van Schendel, related five important frontiers for Bangladesh: ‘land-water’, ‘agrarian’, ‘state’, ‘religious’, and, ‘language’. Of particular importance is the ‘land-water frontier’. For ages, the flooded lowland separated people within near-proximity, thus modulating the dialects and parochial culture. Further, like the flush flood, Bengali nation often exhibit instantaneous wave of sentiment and calm down ever so quickly. (Schendel, 2009). Last but not the least, dense population and limited resource have induced elbow-spacing.

## **Shaping of Democratic Environment in Independent Bangladesh**

**Post-Independence:** Economic challenges in independent Bangladesh had telling effects on the democratic environment. Despite enormous success in other spheres including economy the enormity of the need appeared daunting. Natural disaster and corrupt practices by self-serving individuals complicated the environment. This was played by political forces from right, left and centre. Meanwhile, extremes of the right (Razakars) were banned and left (Naxalites) were marginalised. But imprints and residues remained. Meanwhile, schism, both in polity and in bureaucracy appeared, some managed, while others brewed further. (Jahan, R. 2017)

**Inter-Democratic Phase:** Fateful assassination of the Father of the Nation left perpetual watermark in the political interplay. With his tragic demise, Bangladesh lost the leverage of a unifying figurehead. The next decade and half was marked by military rules and quasi-democratic experiments with burgeoning of political forces – mostly banking on the

centrist majority. (Quader, 2018) Anti-liberation forces regained political and economic space. (Jahan, 2018)

**Democratic Re-entry:** Democracy, in its inclusive sense, was reinstated through the 5th National Parliamentary Election of 1991. Except the caretaker intervention from 2006 to 2008, four parliaments have completed full terms and the fifth is nearing completion. Over the years, alliance politics has gained prominence. (Jahan, R. 2018). The country has made remarkable socio-economic stride, particularly in the last decade. These achievements notwithstanding, democratic environment in Bangladesh, since its re-entry in 1991, is faced with some perpetuating challenges – political and others. Unstable rule of game continue to haunt the process, particularly at every transition.

## **Exercising of Political Rights: Enduring Trends**

**Participation and Democratic Enthusiasm:** Bangladeshis enthusiastically follow and participate in democratic and political processes including rallies, discussions, party activities, and, voting. Voter turnout is one of the important markers. Since 1991, in contested elections, voter turnout is comparable or better than the neighbours including India (66%), Myanmar (69%), Pakistan (53%), Sri Lanka (78%).

**Indirect Participation and Growing Eminence of ‘Money-movers’:** The next trend is of indirect participation, or, participation of the representatives. Interestingly, As the Table 3 shows, aspiring representatives are increasingly coming from professions other than politics, with businessmen growing in numbers over the years. (Firoj, 2013) “It is unfortunate that businessmen are controlling the country’s politics today. This is the most disgraceful development. We must get rid of this trend,” observed the President of the Country in 2015. (bdnews.com, 2015) Professor Rehman Sobhan termed this trend as ‘the dominance by the money-movers’. (Sobhan 2002:5-6).

<b>Table 3: Representation by Profession in the Parliament</b>						
Parliament	Business	Lawyers	Professionals	Agriculture	Politics	Others
First	23.7	26.5	30.7	2.8	12.7	3.9
Fifth	59.4	18.8	15.5	3.9	2.0	0.4
Seventh	47.8	14.8	8.5	6.9	3.1	18.9
Eighth	52.1	8.7	8.4	8.4	2.1	20.3
Ninth	53.5	13.1	6.4	7.5	6.1	13.4
Tenth	59.0	13.0	NA	5.0	NA	23
Source : Journal of the Asiatic Society of Bangladesh Vol. 58(1), 2013						

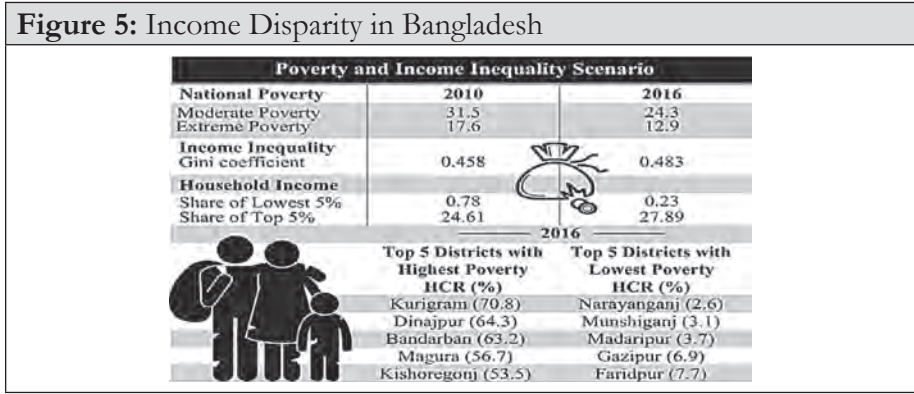
**Growing Inadequacy of Opposition Role:** From 5th to 9th parliaments, oppositions have tended to stay out of parliament in ever increasing proportion. As per the parliamentary watch report by the TIB, oppositions in the 5th, 7th, 8th and 9th parliament have boycotted the sessions for 34, 42, 59 and 83 percentages of times respectively. Such ‘centrifugal’ trend undermines the effectiveness of ‘parliamentary’ system. The 10th Parliament was better placed in this sense. However, the challenge in the 10th parliament was of a different type, which is, absence of a strong opposition – an essential feature for debate and discourse. (Khan, 2018)

**Patron-Cliential Relationship Impeding Growth:** Bangladeshi society in general and politics in particular, have perpetuated a complex network of patron-client relationships, mostly on interpersonal basis. This is reinforced by economic attributes including access to finance, employment, political patronage, socio-political immunity, etc. This, juxtaposed by local influences, often hereditary, form a nexus. Such nexus habitually manifests in lateral entry, lack of democratic practice, limiting the growth on the basis of merit, and so on.

## Status of People's Life and Rights

**Economic Emancipation and Quality of Life/Living:** In the post-independent Bangladesh, there has been an economic backlash on the democratic environment. Ever since, Bangladesh has made remarkable progress, particularly in the last decade. Bangladesh's main challenge remains to better the life of the people. In a laudable stride, Bangladesh has been acknowledged to have upgraded to the status of developing country. (Economic Relations Division, Government of the People's Republic of Bangladesh, 2018) By some estimate, since independence, the country's GDP per capita has grown over 12 times - from \$131 in 1971 to \$1677 in 2018. Food production has increased to 3 to 4 folds (39.2 metric tons in 2017). Poverty level has dropped to around 20% from almost 70% in 1970. Today over 20% population constitute the middle-income group – a measure of social stability. Primary education entry has reached to almost 100%. Average life expectancy has shot up to 72 years. All these growths impacts positively on the life and living of the citizens. (Rahman, 2018) Since 2000, Bangladesh has improved almost 50% in the hunger reduction. (International Food Policy Research Institute, Concern Worldwide, Welthungerhilfe, 2017) Bangladesh has also made remarkable progress in Human Development Index. As per the World Bank Report, the HDI growth rate of >1.6% for most part of last three decades is one of the highest in the region.

Growth notwithstanding, there remains challenges of varying distinction. Firstly, although the overall poverty has dropped, the income disparity has grown consistently. Figure 5 shows that, in 2016, the top 5% accumulated greater share of the resources in the preceding 6 years while the bottom 5% has been reduced to meagre. 23%, less than third of what they possessed 6 years back. Equitability in distribution is a concern. Less than 3% people lived below the poverty line in Narayanganj in 2016 as oppose to 70% in Kurigram.



### Governance vis-à-vis Effectiveness of Institutions

The Economic Intelligence Unit of ‘The Economist’, in its 2017 democracy indexing, ranked Bangladesh 92nd amongst 165 countries. Bangladesh’s score 5.43 is below the world average of 5.48 (World Democracy Index 2017). Good governance calls for efficient institutions aligned to the safe and productive life of the citizens. Bangladesh’s governance indices have improved, but not at the pace of economic growth. In a -2.5 to 2.5 scale by WB, status of Bangladesh in different time phase from 1996 to 2016 is given below.

**Table 4 : Governance Rating of Bangladesh by World Bank**

Indicators	Bangladesh’s Position (from the bottom) and score		
	1996	2011	2016
Voice and accountability	47.60 (-.45)	32.81(-.32)	31.03 (-.56)
Rule of Law	20.70 (-.90)	27.77 (-.73)	30.77 (-.59)
Regulatory Quality	16.67 (-1.00)	22.75 (-.81)	22.12 (-.80)
Political Stability and Absence of Violence/ Terrorism	8.70 (-1.51)	9.00 (-1.40)	10.48 (-1.24)
Government Effectiveness	22.93 (-.82)	24.64 (-.76)	25.48 (-.69)
Control of Corruption	3.41(-1.43)	14.22 (-.109)	21.15 (-.80)

Source : The World Bank

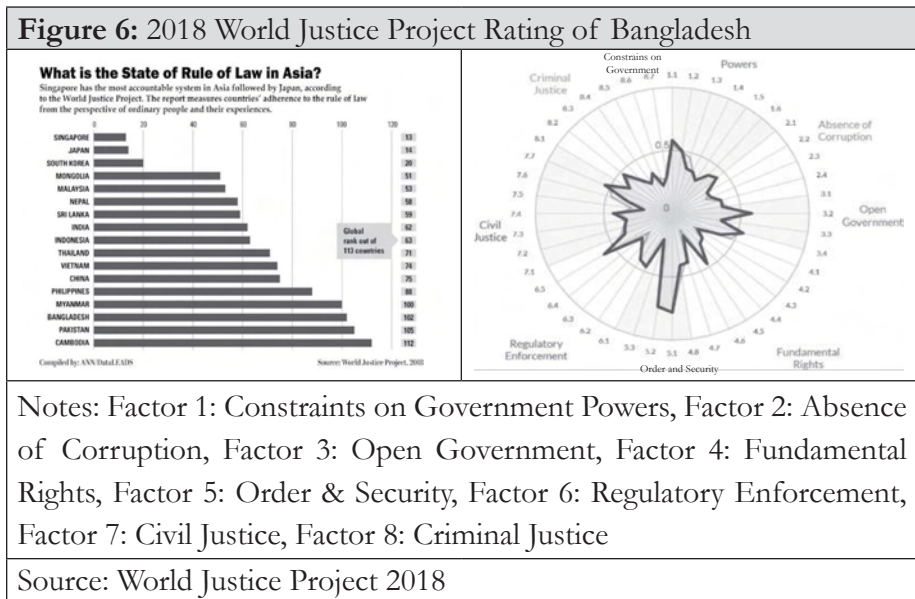


Bangladesh's score although improving slowly, remains in the negative half of the scale. (World Bank) Given the score of 2016, Bangladesh ranked 174th amongst the 194 countries in the 'political stability index', only above Pakistan (-2.47) and Afghanistan (-2.75) in the region.

Assessment of Bertelsmann Stiftung, the German-based foundation, can be inferred here to corroborate with the WB evaluation. Bangladesh is doing remarkably well in 'economic performance', 'currency and price stability' and 'international cooperation'. However, there remains glaring deficits in 'stability of democratic institution' and 'welfare regime' with scores below 4 out of a full 10. (The Bertelsmann Stiftung, 2018)

In the 2018 fragility assessment of countries by The 'Fund For Peace' Bangladesh in ranked 32nd position, dropping one step from 2017 (Fund For Peace, 2017). In the region, it is better than Afghanistan (9th), Pakistan (20th) and Myanmar (22nd) only. (Fund For Peace, 2018)

In the rating of World Peace Project of 2018 Bangladesh's score in the eight denominating areas are dichotomous as can be seen in Figure 6 below.



Another relevant area of reading is the relative peace at which citizens live in a country. As the Table 5 shows, Bangladesh’s status in last one decade is fairly okay in the region but does show a sign of stagnancy.

<b>Table 5 : Global Peace Rating and Bangladesh’s Relative Position in South Asia</b>				
Countries in South Asia	Ratings Since 2008 (among 163 countries)			
	2008	2011	2017	2018
Bhutan	26	34	13	19
Sri Lanka	125	126	80	67
Nepal	NA	95	93	84
Bangladesh	84	83	84	93
India	107	135	137	136
Pakistan	127	146	152	151
Afghanistan	NA	150	162	162

Source: Yearly Reports of Institute for Economics and Peace

Exercise of freedom is fundamental to all rights. An Assessment of Freedom - a study report of ‘Freedom House’ and IDEA suggest that Bangladesh has experienced relative dip in delivering ‘civil and political rights’. (Freedom House, 2017)

Persistent corruption has been an issue for Bangladesh since its early days. It reached staggering proportion in early 2000 plummeting to world’s worst on successive years. Although the situation has been arrested, the global position remains quite low. The notion of ‘equality’ of all, as enshrined in the constitution, is eventually demolished by corruption – be it social, political, legal or others.

**Figure 7: Bangladesh's Rating in Corruption**



Source: TIB and Trading Economics

As per the CPI of 2017, currently Bangladesh jointly stands at 143rd position, two positioned improved from the previous year. The position is only ahead of Afghanistan in the region.

**Perception Indication – A Sample:** Survey from the The International Republican Institute, Bangladesh for 2009, 2014 and 2018 reveals the followings: (1) Generally economic conditions of the respondents have improved; (2) Corruption, political instability, price inflation, education, and, law and order – are enduring concerns facing the society; (3) People hold reservation on role of political parties, more against the oppositions than the incumbents; (4) Quality and fairness of elections has been under unanimous spotlight; (5) Majority disavow violent politics; and, (6) Majority favoured democratic governance. In so far the institutional approval rating of May 2018 go, the standing was Army (80%), Upazilla Parishad (65%), Government (64%), Parliament (51%), High Court (50%), Election Commission (49%), Police (44%) and opposition (42%). (Center for Insight in Survey Research, 2018), (The International Republican Institute, 2014), (The International Republican Institute, 2009)

**Election and Democratic Practices:** This is one area that needs dedicated study as this is the single-most important medium of exercising ‘political rights’ and ensuring representation. This is where Bangladesh has struggled, for it lacks a ‘stable rule of game’. The ‘zero-sum calculation’ and ‘capacity and efficacy of institutions’ are of major concern. (Ahmed, 2018) CGS Peace Report of April 2018 notes few challenges for Bangladesh. These are: (1) Election is not seen as means of democratic practice, rather a means of achieving an end, i.e. control over political power. This end justifies the ‘means’ of muscle-flexing and manipulative ploys; (2) A perception of political power begetting financial gain, social prestige, etc; (3) Intolerance; (4) Lack of intra-party democracy; (5) Small parties’ ‘cottage industry’ character – i.e. ‘sub-contracting’ for bigger parties; (6) Partisan intelligentsia; and, (7) Lack of political agreement and consensus. (Anon., 2018)

## **Towards an Ameliorated Future**

*“Man is born free but in chains everywhere”*

The Opening Sentence of Jean-Jaques Rousseau’s - ‘The Social Contract’

## **Major Inferences**

Following inferences from the discussion thus, are important for contemplating any futuristic contour:

- For obvious reasons, economic priorities were of prominence in Bangladesh. The performance has been praiseworthy. Security has also been effectively maintained amidst emerging and shifting realities.
- Democratic recipe include people at the first place. Other important elements in the democratic interplay include the institutions and policy regime. Irrespective of recipe, a democracy has to visibly deliver ‘equality’, ‘freedom’, ‘mutual respect’ and ‘majority rule conforming minority right’.

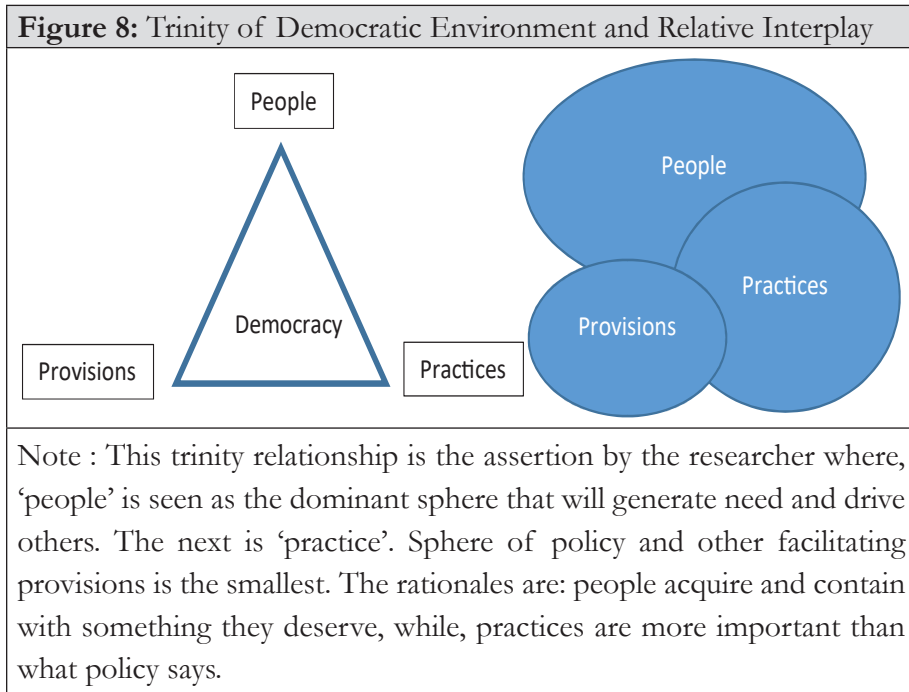
- Bangladesh's democratic leverage wrests, to a great extent, on war of independence that beheld self-determination, mutual respect, secularism, rejuvenation, etc.
- Bangladesh has instituted almost all the required democratic and political institutions. The need now is to make the institutions deliver quality output.
- Elections in Bangladesh receive extraordinarily high voltage for the inherent stake attached to them. In a 'winners take all' parliamentary arrangement, loss is equated to near-elimination. Meanwhile, at the local government level, council election has lost primacy. Instead it is more focused as an election of the chair.
- Bangladesh is on a lofty development trajectory. The growth is juxtaposed by rising level and inclusion in education, large youth, and; technological preponderance. These elements can render socio-political dividends.
- The sheer number and density of population, and, physical and metaphysical merger due to socio-economic transformation, are ought to remove the 'prejudicial view' (localized preference and acquaintance). This too will influence positively.
- Political parties are the first and most vibrant political institutions. Challenge posed by lateral entry, money-movement, and hereditary culture down to roots, etc have to be addressed.

## **Building a Conducive Environment**

In outlining possible measure, this study is guided by some essential reckoning. First, no rearrangement is considered necessary to solve morale deficiencies and to heal democratic abrasions. Indeed, good practices, rule of law and effective precedence would set the scene aright. As Fukuyama maintained, liberal democracy as a model, has reached the pinnacle of evolution. However, countries have to customise respective good practices.

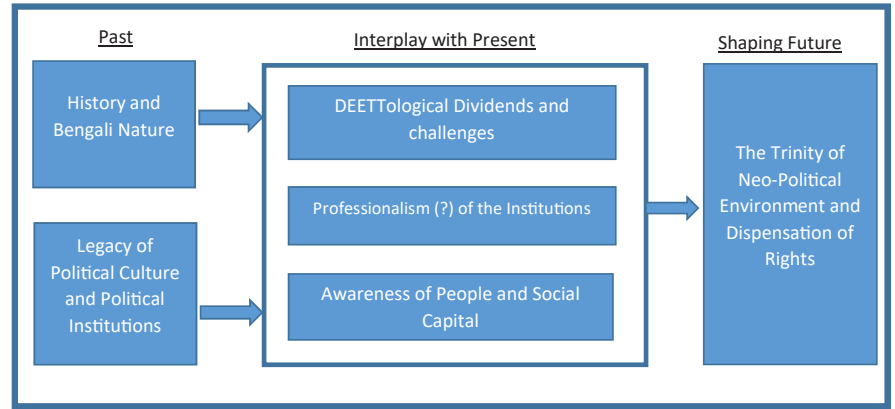
With that in the backdrop, it is felt that a democratic environment is ‘an interplay’ of the people (practitioners and beneficiaries), the practice (culture) and the provisions (law and protocols).

**Ameliorating the Future:** This study infers that the democratic environment is an interplay of trinity involving people, process and provisions as portrayed below:



The above trinity is influenced by certain imperatives, historical and contemporary. This being the reality, shaping of a futuristic environment is graphically represented (researcher’s model) in Figure 9.

**Figure 9: Outlining the Future**



**Notes:**

- (1) DEETTology include: ‘Demography’, ‘Economy’, ‘Education’, ‘Time’, and, ‘Technology’.
- (2) To a great degree, the democratic environment will be shaped by the astuteness and professionalism of the democratic and state institutions.
- (3) In Bangladesh, awareness of ‘right’ and ‘responsibility’ will also help shape the ‘democratic environment’.

The historical legacy and political interplay have assumed social dimensions. Thus, metamorphic changes are difficult to achieve, at least in short to medium term. However, the DEETTological factors, improved awareness of rights and responsibility, and, ability of the institutions can help shape the environment better.

In DEETTology – the first of the factors is ‘demography’. Bangladesh is eighth largest by population and 5th largest by the size of democracy. The density, homogeneity and youth (average age below 30) will usher in certain dividends, as also challenges. The population has to be developed as prime resource to yield any dividend. If ‘citizen control of agenda’ is a democratic norm, the demography of Bangladesh will induce policies for all the good

reason. Indeed, the young and educated generation, as maintained by Dr Akbar Ali Khan, will help improve quality of the democracy.

The economy, education and technology will play out in unison. Higher economic growth is set to bring forth higher expectations reinforced by better education – both in terms of number and level. However, ensuring quality education and harmonising varying streams - essentially manifesting in varying cultural and ideological tectonics, remain challenging. Meanwhile technological dividends will make real time impact – both good and otherwise.

One of the major stride should be to enhance the social capital. Without richness in social capital, public good cannot be maximised as the interaction between resources (human and others) will remain inapt. Further is discussed under ‘people’ later.

Finally, time remains to be as significant factor which will contemporises priority and ready the society to embrace the future. Sheer spending of time will add to the democratic experience. Dr Akbar Ali Khan contemplates bright democratic prospect for Bangladesh in course of time. (Khan, 2018)

## **Addressing the Trinity and Shaping the Future**

**The People:** ‘People’ is the most important input of democratic environment. This study, consistent with best practices around the world, outlines some ‘to-be-done’ essentials. Need for social capital is already highlighted. Quality of education is indispensable. Quality education vis-à-vis enhanced social capital will help build trust between people to people, between people and institutions, and between people and development initiatives. The other aspect of social capital is developing social norms and obligations. This too is an outcome of good practices and value education. And the final element of social capital is social networking of people and voluntary effort towards ensuring good living for all. More so, this will raise enlightened and responsible leadership and citizenry. The education should draw inference from the spirit of the Liberation War.



On the account of realizing the legally instituted rights, citizens should be informed and educated on right-based citizen charter, its implementation and redress arrangement.

**The Practice:** Political interplay in Bangladesh has mostly been quite murky and the fallout effects were disconcerting. A National Task Force was set up back in 1991 to suggest measures towards congruent role of political parties for the development of the country. The task force made 10 recommendations. Of those at least 5 are still valid. These are: long-term planning which will include people in the process, strengthening of parliamentary committees, accountability of political parties and internal democracy, free flow of information, and, empowerment of women. (Dr Nazma Chowdhury, 1992) Money-space in politics is to be curbed. Political consensus has to be strived on national issues. Last but not the least, Think Tanks and independent bodies have to make effective contribution without prejudice bias.

**The Provisions:** This study considers it timely to modify and improve certain policy provisions. These are. First; in the parliamentary system, proportional representation may be weighed against the ‘winners take all’ model. This should be duly deliberated at different tracks. The idea is supported by many including the Chief Election Commissioner. (Huda, 2018) Second; at the local government level, the focus of election should be on the council and not of the chair. These two measures are expected to reduce undue hype and weight vis-à-vis intense elbow-spacing during elections. Third; institutions have to be imbued with the teaching of how to ensure human and citizen rights. Capacity of the HRC has to be enhanced, which is lagging now. (Rahman, 2018). Fourth; strict and equitable enforcement of law, as embedded in the constitution, is to be ensured and perceived. Institutions have to improve the approval ratings. Benefits of security, law and order, and, development have to equally felt by all. (Kamal, 2018) Fifth; lumbering of judiciary with huge pending cases have to be addressed and approval rating has to improve. Sixth; objective and free/transparent media should be facilitated. And last; political parties

need to revisit internal process of democratization and upward growth of leadership and movement of agenda. Efforts have to be taken to curb money-movement and lateral entry. When in power, distinction should be clearer of the governance and the party.

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Brigadier General Abul Fazal Md Sanaullah was commissioned on 24 June 1988 in infantry. He served in number of infantry units as company officer and staff. His command include that of an Infantry Battalion and an Infantry Brigade. As staff, he served at Grade 3 level at an Independent Brigade Headquarters and as Grade 2 Staff in the Military Operation Directorate of the Army Headquarters. As Instructor, he was Instructor Class B at the Tactics Wing of School of Infantry and Tactics, and, Directing Staff and Instructor Class A in the Defence Services Command and Staff College. He was Colonel General Staff at Directorate General of Forces Intelligence and was the Commandant, Army Security Unit. Brig Gen Fazal was part of Bangladesh UN Contingents to Somalia and DRC. He is an alumni of Defence Services Command and Staff College, Mirpur, Bangladesh; US Command and General Staff College, Fort Leavenworth, USA; and; College of Defence Management, Secunderabad, India. Presently he is a PhD research fellow at Bangladesh University of Professionals. He loves playing golf.

# **THE ROLE OF BANGLADESH ARMY IN NATIONAL FOOD SECURITY MANAGEMENT**

**Brigadier General Kazi Shameem Farhad, ndc, psc**

## **Introduction**

Bangladesh, with a high population density suffers the wrath of poverty since its independence in 1971. Threat of food insecurity shadowed too until 1980s after which the country came on track to self-sufficiency in food. The country with the utmost hard work of the scientists and farmers grew rice almost three times more than it grew in 1970s. Bangladesh tried to cope with various causes of food insecurity but, yet to fulfil all the criterions.

In last one decade or so, Food security situation in Bangladesh has improved, especially on the availability side. Bangladesh could overcome the scarcity of food, but still we have lot of rooms for improvement in the food accessibility, affordability and utilisation perimeters. Government initiative to mitigate food security has reduced the percentage of low-calorie intake people but, due to poor management from crop field to consumer we are yet to ensure sustainable food security for our country.

Army as part of Defence Forces is basically equipped and trained to protect the sovereignty of a nation. Armies of other countries are now not only seating tight by only preparing for war. Rather, they are contributing to the economy and food sectors by their men, material and knowledge. Besides its primary role, it has also extended its support for nation building and various 'In aid to Civil Power' duties. As a disciplined and accountable force, it is likely to contribute more not only in the physical security of the country but, also in the National Food Security Management. In this study effort is taken to identify the limitations and challenges of National Food Security Management System with a view to recommending the measures to be taken by Bangladesh Army in support of concern government machineries.

## **Conceptual Clarification of Food Security Management**

### **Concept of Food Security**

Food security as a concept originated in the mid-1970s, in the discussions of international food problems at a time of global food crisis. In 1983, FAO expanded its concept to include securing access by vulnerable people to available supplies, “ensuring that all people at all times have both physical and economic access to the basic food that they need”.<sup>1</sup> A process of international negotiation followed, leading to the World Food Summit and a definition of food security was formulated. They defined it as “availability at all times of adequate world food supplies of basic foodstuffs to sustain a steady expansion of food consumption and to offset fluctuations in production and prices”.<sup>2</sup>

### **Reasons of Food Insecurity**

Food Insecurity is the state of being without reliable access to a sufficient quantity of affordable, nutritious food. The FAO defined food insecurity as: “A situation that exists when people lack secure access to sufficient amounts of safe and nutritious food for normal growth and development and an active and healthy life.”<sup>3</sup> With the growth of population in the world the food production increased manifold too. But it is until 1980s and 90s the situation reached at a critical juncture which virtually was a wakeup call for the world. The causes of food insecurity are diverse and complex in nature. Some of the direct and indirect causes of food insecurity is population growth, food shortage, increase of price, climate change, reduced crops land, unsafe food, poor market monitoring and poor market access.

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1 FAO, 2002. Trade and Food Security: Conceptualizing the Linkages Expert Consultation. Rome, FAO, p.2.2.

2 FAO, 2006. Food Security. Policy Brief, June, Issue 2, p.1.

3 FAO, 1996, Report of the World Food Summit.

## Relation between Management and Food Security

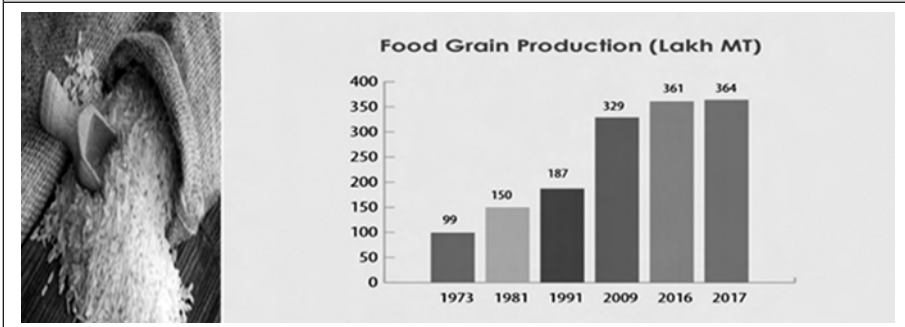
The Food Security Management System (FSMS) allows demonstrating the ability of the organization to control food hazards and to guarantee that the food is secure for human consumption.<sup>4</sup> This standard applies from the farm to consumer throughout the supply chain. Management of all dimensions of food security i.e. availability of food, access to food and nutrition and utilization of food through country's proper information and implementation system could be considered as National Food Security Management (NFSM).

## NFSM: The Bangladesh Perspective

### Food Security Purview

Bangladesh's production of food grain has shown a steady increase since independence, increasing from about 10 million metric tons in the 1973 to more than 36 million metric tons in 2017, see figure 1. The production increased in general although the population grew in parallel. Except pulse and wheat all crops increased in production as the time passed. Rice, Maize and potato increased remarkably from 2001.

**Figure 1:** Food Grain Production Bangladesh



<sup>4</sup> SGE-Consultores, 2018. 'ISO 22000 Food Security Management Systems', Available at: <http://www.sge-consultores.com/en/certifications/iso-22000-food-security-management-systems/> accessed on 25 May 2018.



Bangladesh is one of the malnourished countries of the world. This means many citizens do not eat a balanced and nutritious diet, even in good harvest years. The calorie intake of Bangladeshi people has improved from year 1990. But still it is less than other neighbouring countries like India, Nepal, Maldives and Myanmar.<sup>5</sup> For people in most developing countries, the daily calorie average is 2,828. In Bangladesh, that average is only 2,190.

## **Food Security Analysis of Bangladesh**

One of the most densely populated country in the world besides city states, Bangladesh graduated to lower-middle-income country status in 2015. Despite huge population increase and serious hunger problem there has not been any incident of death due to hunger since last three decades. Can Bangladesh be then termed as hunger free or food secured country? The answer is probably not that easy to find out. For a prudent and truthful answer, indicators of food security (availability, access and utilization) are examined in Bangladesh context subsequently.

**Availability:** Domestic production, external trade and the efficiency of distribution through market and other channels determine “availability” of food. There has been substantial improvement in the availability of food in Bangladesh in recent decade. Table 1 below shows per capita availability of food grain increased from 442 gram in 2010 to 510.5 gram in 2012.<sup>6</sup>

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5 Ritchie, M. R. a. H., 2018. ‘Our World in Data.’ Available at: <https://ourworldindata.org/food-per-person> Accessed on 10 July 2018

6 Yunus, M. H. a. M., 2016. ‘Estimates of Per Capita Consumption of Food Grains in Bangladesh’. Bangladesh Development Studies, XXXIX, March-June(1&2). P.107.

<b>Table 1:</b> per capita availability of food grain <span style="float: right;"><i>(in grams)</i></span>						
	Authors' Estimates			HIES 2010 <sup>2</sup>		
	National	Rural	Urban	National	Rural	Urban
Cereals <sup>a</sup>	510.5	566.1	341.9	442.0	464.9	377.8
Rice	468.9	538.6	257.6	416.0	441.6	344.2
Wheat <sup>b</sup>	41.6	27.5	84.3	26.0	23.3	33.6
<p>Note: a. It may be noted that the definition of “cereals” in this exercise, which comprises rice and wheat flour, differs from the one used by the BBS in its HIES which includes “all others” in addition. b. Wheat consumption in the analysis is actually wheat flour in order to make Authors' and HIES estimates comparable.</p>						
Source: BIDS Field Survey, 2012 and HIES, 2010 (Yunus, 2016)						

**Accessibility:** Accessibility of food refers to affordability, allocation and preference. Poverty has a direct role in ensuring affordability of food. Poor people are unable to buy sufficient food resulting in consuming fewer intakes (Calorie) than needed. A good percentage of people of the country cannot afford required food for some period of time or throughout the year. The agricultural land of the country cannot produce same type and amount of crops for natural reason. The char areas of Kurigram district or the hilly areas of Sylhet districts cannot produce sufficient cereals for their local cultivators. At the same time when at Dhaka potato is sold with taka 18-20 per kilo, the poor farmers at Nilphamari is getting only taka 1-2 per kilo. Poor dispersion of food limits, allocation of required food to all people and also restricts the choice of foods.

**Food Utilisation:** Ensuring nutritional value, social value and food safety are the key factors of Food utilisation. Utilization is ensured through access to appropriate diet, safe water, sanitation and health care. Bangladeshi diet is more of a carbohydrate heavy diet. Most of our people are not aware of balanced diet with a good combination of Protein, Carbohydrate, Fat, minerals and vitamins.

## **Bangladesh in the Global Food Security Index**

Using the definition adapted from the 1996 World Food Summit, the Global Food Security Index (GFSI) considers the core issues of affordability, availability, and quality across a set of 113 countries.<sup>7</sup> On 2017, Bangladesh stands on the 89th position -- the lowest among the South Asian countries. Bangladesh scored 39.7 out of 100 which is 1.3 score more than previous year (2016). There are seven major challenges identified. These are insufficient Public expenditure on agricultural R&D, Corruption, inadequate diet diversification, Gross domestic product per capita (US\$ PPP), Micronutrient availability, Protein quality and Food consumption as a share of household expenditure.<sup>8</sup>

### **Causes of Food Insecurity in Bangladesh**

**Over Population:** With the population growth the domestic demand is increasing every year. Therefore, with the increase of population food security is directly affected.<sup>9</sup>

**Shrinking of Agricultural Land:** Due to industrial and population growth the cultivatable land is decreasing by 1% annually. This had direct impact on production of food.

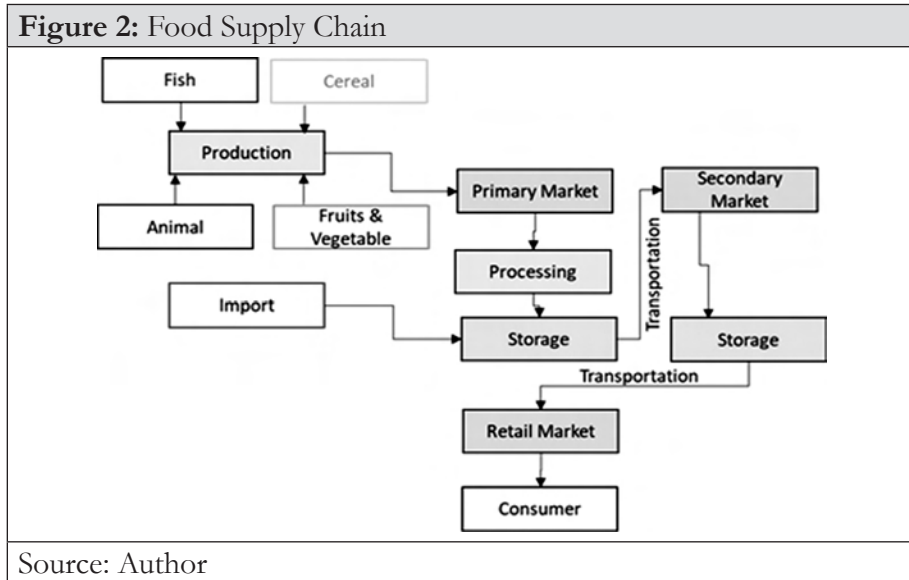
**Poverty:** Food insecurity is an analogy of poverty in Bangladesh. According to the statistics about 23.2% of 166.33 million people of Bangladesh live below poverty level. i.e. their daily calorie intake is less than 1800 kilo calorie as set by the World Bank.

**Food Supply Chain in Bangladesh:** The farmers or producers seldom have the access to the retail market. Through middlemen and retailers, the food commodities are sold to consumers with 3 to 5 times higher than the original field price. From Garden or farm to consumer food supply chain is as shown in figure 2.

7 The Economist, 2017. 'Global Food Security Index.' Available at: <http://foodsecurityindex.eiu.com/> Accessed 22 May 2018, p.41.

8 Ibid.

9 Sunon, Shaoli., 2018. Ministry of Food, Interview, taken on 02 August 2018.



**Slow Modernization of Agricultural cultivation:** In agriculture sector, despite attempts since last two decades, progress of modernization is slower than it expected.

**Effects of Climate Change:** Bangladesh is one of the worst sufferers of climate changes in the world.<sup>10</sup> Between 30 and 50 percent of the country suffers severe climate shocks every year, with detrimental impacts on the lives and livelihoods of the still predominantly rural population.<sup>11</sup>

**Natural Disaster:** By nature Bangladesh is a disaster prone country. About 50% of its population, mostly poor, lives in the disaster prone areas.

**Malnutrition:** This is a condition that results from eating a diet in which one or more nutrients are either not enough or are too much such that the diet causes health problems. Our food is carbohydrate heavy and lack of other good nutrients.

**Lack of Safe Food:** Ensuring safe food is a pre-requisite for National Food Security. Adulteration of food has become a common threat to

<sup>10</sup> Ibid

<sup>11</sup> WFP, 2018. 'Bangladesh.' Available at: <http://www.wfp.org/countries/bangladesh>, Accessed on 03 June 2018.

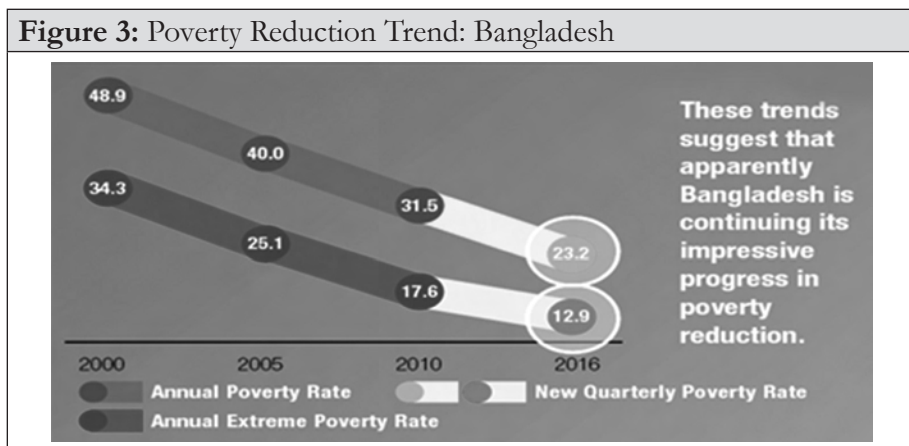
human health. Maintenance of food safety standard is a prerequisite for healthy life.

## Government Initiatives towards NFSM

**National Food Policy 2006:** Bangladesh Constitution (article 15 a) made food as a fundamental right of its citizen and warranted the government to ensure it. The National Food Policy 2006 is to ensure a dependable food security system for all people of the country at all times. The objectives of the food policy are:

- To ensure adequate and stable supply of safe and nutritious food;
- To enhance purchasing power of the people for increased food accessibility; and
- To ensure adequate nutrition for all (especially women and children).

**Poverty Reduction:** GoB is on the right track of Goal-1 of SDG. Poverty reduction trend suggest that apparently Bangladesh is continuing its impressive progress in poverty reduction.<sup>12</sup> See Figure-3:



<sup>12</sup> World Bank Group, 2017. National Poverty Level of Bangladesh. Available at: [http://203.112.218.65:8008/WebTestApplication/userfiles/Image/LatestNews/Infographic\\_HIES\\_2016.pdf](http://203.112.218.65:8008/WebTestApplication/userfiles/Image/LatestNews/Infographic_HIES_2016.pdf), Accessed on 22 June 2018.

**Social Safety Net Programs:** Food for Works (FFW), Vulnerable Group Feeding (VGF), Vulnerable Group Destitute (VGD), Test Relief (TR) were some of the initiatives by the government. Since September 2016, government is distributing food through “Food-Friendly Programme for the Ultra-Poor”, targeting some 5 million poor families across the country. The scheme aims to provide poor families the opportunity to buy up to 30 kg of rice per month in September, October, November and in March and April during the lean season at a price of taka 10 per kg.

**Water Management and Irrigation:** Steps are being taken to increase water catchment areas for irrigation. Every year efforts are made to bring more land under irrigation for better production. Bangladesh Water Development Board and LGED try to maintain river embankments and dams. Beside regular dredging efforts are made to undertake capital dredging for holding more water and reduce flash flood.

**Storage and Procurement:** Every year Ministry of Food fix a target to procure food as buffer stock to sustain the shocks of natural calamity and external issues. Government aim to have food grains storage capability from 0.5 million metric ton to 2.44 million metric ton by the end of 2018. Government has taken steps to build up small silos at coastal and flash-flood zones, each with 100kg storage capacity, to help 5 lakh families store rice to use in times of disaster.

**Scientific Research for Crop Diversification:** The government research and development agencies like, BRRI, BARI, BJRI, BFRI, BINA, BWMRI, BTRI have successfully contributed to develop new varieties seeds and cultivating accessories.

## **Identifying the Limitations and Challenges of NFSM**

**Ineffective Market Management:** The links of our food supply chain between producer, buyers and consumers are sometimes too far, not by distance but by price. Throughout the chain of supply the food items are subject to extortion. The government does not have any effective

regulatory system to control the price hike or unethical stocking of food items. Lack of market intelligence on domestic and international markets often results rise of essential commodity.

**Poor Transportation Infrastructure:** Inadequate infrastructure including communication networks created hindrance to achieve food security issues. The railway lines and Rail Track Wagons (RTW) are very meagre than our domestic requirement. The cheapest mode of carrying goods is river route. But, due to lack of navigability we are unable to use this mode with optimal output.

**Lack of Adequate Food Storage:** During scarcity of food due to natural calamity, one of the main reasons of food insecurity is government's failure to maintain a sufficient amount of buffer food stock. Last year (2017) after two consecutive floods at greater Sylhet area due to shortage of buffer stock (below the threshold level of 0.8 million metric tons) Bangladesh had to buy rice from Myanmar having a strain relationship due to Rohingya crisis.

**Bureaucratic Ineffectiveness:** Despite good numbers of achievements on poverty reduction and food production, our bureaucratic efficiency is still under criticism. There are allegation against some of the government officials serving at the rural areas that they are displaying lack of initiative and responsibility. Farmers are sometimes not confident about the quality of seeds distributed by BADC.<sup>13</sup> Alleged corruptions in the concerned government agencies at various level reduce the overall efficiency of the government to ensure sustained NFSM.<sup>14</sup>

**Lack of Implementation of Laws:** To ensure safe food, there are rules or policies encompass the offences like fake licenses, poor quality of food, substandard infrastructure and lack of hygiene, food adulteration, food impurity, incorrect information on food packages, selling products with

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13 Alam, M. S., 2015. Dilemma in Quality Rice Seed Production. Available at: <https://www.thedailystar.net/dilemma-in-quality-rice-seed-production-37652>, Accessed on 28 July 2018.

14 Bangladesh Corruption Report, 2018. Business Anti-Corruption Portal. Available at: <https://www.business-anti-corruption.com/country-profiles/bangladesh>, Accessed 30 July 2018.

expired date etc. There are lot of gaps and overlaps in the existing food safety acts and regulations.<sup>15</sup> Problem lies in their sustained and appropriate implementation by coordinated and synchronized effort by the credible authorities.

## **Army in Food Security Management: Selected Global Experience**

### **Military in Food Security**

An army is a purposive instrument, rationally conceived to fulfil certain objectives; its central purpose is to fight and win wars in defense of the state. Throughout the world, with few exceptions, armies represent professional, highly structured, hierarchal organizations characterized by high levels of discipline and motivation. By virtue of their function and training, armies also acquire highly prized skills and values, such as the capacity for intercommunication, an esprit de corps, and self-sufficiency. A military's unique structure facilitates rapid decision making and efficient execution of these decisions. These institutional characteristics provide military organizations with the potential to undertake social action well beyond the defense function.<sup>16</sup>

### **Employment of Army at Food Security: Selected Global Cases**

**Chinese People Liberation Army:** China has reportedly reassigned over 60,000 soldiers to plant trees in a bid to combat pollution by increasing the country's forest coverage. It comes as part of China's plan to plant at least 84,000 square kilometres (32,400 square miles) of trees by the end of the year, which is roughly equivalent to the size of Ireland.<sup>17</sup> The aim

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15 Haque, M. M., 2018. 'Bangladesh Food Safety Authority.' Interview taken on 14 May 2018.

16 Gotowicki, L. S. H., 1997. 'The Role of the Egyptian Military in Domestic Society.' Accessed on 24 May 2018.

17 Osborne, S., 2018. 'China reassigns 60,000 Soldiers to Plant Trees in bid to Fight Pollution.' The Independent, 13 February, p.1.



is to increase the country's forest coverage from 21 per cent of its total landmass to 23 per cent by 2020<sup>18</sup>.

**Nigerian Army:** Nigerian Army's Barracks Investment Initiative Programme has announced the establishment of a vast cattle ranch in Giri area of the Federal Capital Territory (FCT), Abuja. The ranch establishment is the first of the military initiative programme and aimed at achieving food security and supporting the nation's agricultural potentials. The cattle that will be bred from such ranches will add to the national stock, and serve both military and civilian interests.<sup>19</sup>

**Egyptian Army:** The military's role in Egypt's economy is represented in four primary sectors: military industries, civilian industries, agriculture, and national infrastructure. The huge quantity of arms and equipment production creates a good scope of employment and indirectly helps poverty alleviation. A good number of non-profitable civilian industries are given to Egyptian Army. With their good management the Army turned them into profitable industry. Under the auspices of the Food Security Division of the National Service Products Organization (NSPO), the military set a goal of 100 per cent self-sufficiency in food stuffs. In the early 1980s, the NSPO began to develop a broad network of dairy farms, milk processing facilities, cattle feed lots, poultry farms, and fish farms.<sup>20</sup>

**Indonesian Army (Tentara Nasional Indonesia-TNI):** Indonesian government is moving quickly to create a big impact in the agricultural and food sectors by imposing two big agenda. The first is to boost rice production to achieve 100 percent self-sufficiency. The second is to graduate from 100 percent rice self-sufficiency to be a rice exporting nation. To achieve these targets, the Ministry of Agriculture (MoA) recently planned to re-utilise the military's (TNI) civic mission (TNI Manunggal Masuk Desa) through the Village Supervisory Non-Commissioned Officers (Babinsa) as quasi-agricultural extension officers. Amran Sulaiman, the minister argued that

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18 Oliver, L., 2018. 'China has sent 60,000 soldiers to plant trees.' Accessed 01 on July 2018.

19 Mohammed, Z., 2018. 'Food Security: Nigerian Army Establishes Cattle Ranches and Farms.' Accessed 08 April 2018, p.1.

20 Raphaeli, N., 2013. 'Egyptian Army's Pervasive Role In National Economy. Inquiry & Analysis Series Report,'29 July.Issue 1001.

“50,000 Babinsa across the country would be a big help to cover the deficit of 20,000 agricultural extension officers (AEOs).”<sup>21</sup>

**Kenyan Army:** The Kenyan scholars have correctly identified that the main duty of the army is to supplement the other organs of the state to provide National Security.<sup>22</sup> Kenyan Army’s engineering units working hard by provisioning of access roads in rural areas for food security and disaster management. There veterinary and farm corps of Kenyan Army are working side by side with the government machineries to enhance the agricultural products like crops, fisheries and cattle stocks of the country.

**US Army’s FSM in Afghanistan:** In Afghanistan, US Army instructors are focusing on row planting, pest control, livestock care, and green house management; all important techniques that will enable farmers to increase crop yields and pass along the requisite knowledge, skills, and abilities of sustainable farming to future generations.

**US Army’s FSM in Iraq:** The US Department of Defense (DOD) requested for support from US Army’s Veterinary Service, which is source of expertise for animal care and food safety. Military veterinary are contributing in important ways to economic development of Iraq as part of US Army’s Stability Operations. US Army considered that better animal stocks and agricultural products result more availability of food source and therefore ultimately ensures sustained Food Security.<sup>23</sup>

## **Role of Bangladesh Army in NFSM**

### **Army’s Current Engagements and Steps towards FSM**

Bangladesh Army has become an inspirational institution for nation building activities. As a disciplined and motivated force it is always eager

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21 Lassa, J. A. a. A. P., 2015. Jokowi’s Food Sovereignty Narrative: Military in the Rice Land?.S. Rajaratnam School of International Studies (RSIS) Commentary, Nanyang Technological University, Singapore, 27 February.

22 Kibicho, F. M., 2005. The Role of Military in National Development: A Case Study of Kenya. Nairobi: s.n, p. 65.

23 Moore, M. a. G. F., 2008. Toward the Effective Use of Military Veterinarians in Stability Operations. Available at: <[www.rand.org](http://www.rand.org)> Accessed on 02 April 2018.

to shoulder any responsibility given by GoB. It has trained manpower, adequate resources and capable to complete any given task within shortage possible time. Having the ability to work 24/7 with systematic approach to solve any challenge, made Bangladesh Army a unique and reliable government machinery. Bangladesh Army as part of their nation building activities has done a good number of works. Some of these works has direct and indirect effect on our NFSM:

- **Remount Veterinary & Farm Corps:** The prime responsibility of Remount Veterinary & Farm Corps (RVFC) is to produce milk product for armed forces personnel, animal husbandry of horse for ceremonial purpose and dogs for security purpose.<sup>24</sup>
- **Infrastructural Development:** As part of counter insurgency operation and nation building activities, numbers of road construction projects have been accomplished by Bangladesh Army for which the communication network for the hilly people developed remarkably enabling them to sell their agricultural products in the plain land.<sup>25</sup> Bangladesh Army is also involved in building number of roads and culverts.
- **River Maintenance:** As part of nation building activities and in aid of civil administration duties, Bangladesh Army often called to maintain embankments and river dams to protect the agriculture land from flash flood.
- **Recovery of Canals and Minimise Pollution:** In response to agricultural and industrial water pollution, Bangladesh army was involved to regain the flow of some rivers and canals. Their recent work at HatirJheel, Dhaka project is praiseworthy.

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24 Hannan, Abdul, Brigadier General, 2018. 'Role of RVFC in National Food Security Management,' Interview taken on 12 June 2018.

25 Armed Forces Division, 2014. 'Armed Forces in Nation Building Activities.' Available at: <https://www.afd.gov.bd/images/pdf/Army%20Suppliment%20English%20Page%2002%202013.pdf>, Accessed on 24 June 2018.

- **Storage Capabilities:** Storage of food plays a significant role on Food Security.<sup>26</sup> Like any other country's army, Bangladesh Army has the capacity to have self-sufficiency in case of food for 6 months. Army has a well distributed and coordinated storage system to store rice, flour, pulse, edible oil, salt, sugar, tea etc.
- **Distribution of Relief:** In any post disaster relief operation Bangladesh Army has to assist local government administration for smooth distribution of food and other life saving commodities to affected or victims of cyclone, flood, land slide etc.
- **Bangladesh Machine Tools Factory (BMTF) Limited:** It is a state- owned limited company under the management of Bangladesh Army. The primary objective of BMTF is to conceive and pursue on any special project related to transport, agriculture, energy and other viable sectors, with a view to making the factory economically and operationally vibrant in multidimensional fields as the changing situations demand.
- **Sena Kallayan Sangstha:** Sena Kalyan Sangstha (SKS) started its journey as Post War Services Reconstruction Fund. SKS has 8 industrial units, 5 commercial units and 6 real state units. It offers numbers of products and services like construction materials, food items, electronic products, energy plant, garment items, insurance etc. With all these activities it provides employment and directly and indirectly contribute to the national food security.
- **Bangladesh Diesel Plant (BDP) Limited:** BDP Limited is one of the prevalent manufacturers of different types of spare parts for machineries, die-mold, concertina wire, irrigation pipe and several types of industrial items. BDP Limited is actively engaged in the renewable energy sector to meet both rural and urban needs.

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26 Tovma, L. a. D. E., 2013. 'Improving Food Security Military units of Internal Troops Manning the Military Under Contract Service.'Scientific Works of Kharkiv National Air Force University, Volume 4(37).

- **Army Aviation Group:** Army Aviation Group is also equipped with good numbers of utility aircrafts including various types of helicopters. With its new and enhanced organisation Army Aviation Group has started its journey from 2016 and will be fulfilled its aircraft requirement by 2021.
- **Transformation of Unused Land:** Bangladesh Army plants more than a million trees as part of Yearly Plantation Program. The troops deployed at Swarno Deep transforms this abandon coastal island to a green island keeping an example to nation.
- **Swarno Deep:** A Bangladesh Army Model for Food Security Management. Army is doing integrated farming at Swarno Deep Noakhali close to the Bay of Bengal. They are producing fish in the ponds (prepared as fresh water reservoir by Army), vegetables on the banks, rice and nuts on the field, fodder on the low lands, poultry (chicken and duck) over the ponds and canals, pigeons on the fruit trees (which was also planted by army). Army has started farming buffalo. From these buffaloes we are getting fresh milk, producing ghee and butter.<sup>27</sup>

## **Limitation of Bangladesh Army in NFSM**

- In the Food Policy Working Group there is no planned participation of MoD or Armed Forces Division. That limits Army as a stakeholder to involve in the speedy and overall implementation of National Food Policy.
- The resource constraint especially manpower and equipment related to NFSM is another mentionable limitation for Army.
- The potentiality of RVFC is not fully utilised by government due to lack of policy to involve them in the NFSM.
- Due to lack of policy initiative the capability of BMTF and BDP are not utilised in the NFSM issues.

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<sup>27</sup> Hannan, loc. cit.

- In the AHQ there is no civil response directorate (Military operations other than war Directorate) which will be responsible for nation building, disaster management, FSM etc. Presently the Military Operation Directorate is looking after this.
- The training of Bangladesh Army is basically for the preparation of war with few segments of Military operations other than war (MOOTW). There is no training or course or package of instruction for Army's involvement in NFSM.

## Recommendations

Analysing the large amount of variables involved and the enormous tasks at hand, a pragmatic 'way forward', as assessed by the researcher to bring about 'the role of Bangladesh Army in NFSM' recommends certain measures. These are as follow:

- **Utilisation of RVFC:** RVFC of Bangladesh Army is to be utilised for cattle, poultry and vegetable production at remote and interior unused lands. They can be utilised to train the trainers of concern persons working under Ministry of Fisheries and Livestock. They also can contribute in the NFSM offering their Laboratory facilities to local farmers.
- **Utilisation of Army owned Factories:** Besides producing a good number of loads carrying transports, BMTF may produce agricultural equipment for ploughing, sowing, harvesting for our farmers. BDP also can produce various types of tube well, irrigation pumps for our cultivation. SKS can also increase the number of food products (including fodder) to contribute to the sustained NFSM.
- **Supporting Social Safety Net Program:** Bangladesh Army can be asked to monitor, distribute of relief and food stuffs through VGF, OMS etc. to the poor and disaster affected people in support to local administration.

- **Propagation on Safe Food:** Army can be a part of National Awareness Program on Food Safety during its training and non-operational deployment at the rural areas.
- **Improvement of Transportation Network:** Bangladesh Army will be a great asset for GoB to utilise them for construction and improvement of road network of the country. Bangladesh Army can also be utilised to keep the river flows or channels fit to take riverine cargo vessels in close coordination with concerned ministries.
- **Using the Assets of Army Aviation Group:** Aviation Group can be utilised for rapid carrying of food, relief materials and affected people during any disaster. The aviation assets can also be employed to spread the seeds of mangrove trees at our coastal areas.
- **Water Pollution:** To ensure clean and fresh water, monitoring and implementation of policies against agricultural and industrial pollutions can be ensured by sharing the responsibility to Bangladesh Army. The R&D wings of BMTF Limited and BDP Limited can be asked to prepare cheaper water treatment plants for our industries to reduce water pollution.
- **Protection from Sea Level Rise:** Army Engineer assets can build and repair numbers of dykes, embankments and dams to protect our cultivable lands. We can also dig numbers of water reservoirs for storing fresh water for cultivation and household use at coastal areas.
- **Initiatives responding Climate Change:** To mitigate and reduce climate change effects Bangladesh Army can be utilised to convert unused lands to cultivable lands at the chars of her rivers. Army can also be employed to restore and transform coastal areas to green belt by planting mangrove trees.
- **Best use of Storage Facility:** With the close coordination of MoF, Bangladesh Army can be asked to ensure best utilisation of the storage capacity (Private and Government owned) within the formation areas during the time of need.

## Conclusion

With growing requirement of food, restoring the food security of the country is a great concern for Bangladesh. Though we are about to become self-sufficient in food, because of various reasons still we could not fulfil the right to food to our 100% citizens. In this study after threadbare analysis the causes of food insecurity of Bangladesh are identified as: over population, inaccessibility of food due to poverty, shrinking of agricultural land, climate change and natural disaster, slow modernisation of agro machineries, water pollution, internal and cross border displacement etc.

After identifying the causes of food insecurity in Bangladesh efforts have been taken to find the limitations of present NFSM. These are: poor market system, lack of market monitoring and intelligence, lack of road network to interior, insufficient food storage facilities, lack of ensuring safe food, lack of implementation of laws, unofficial bribe during transportation, scarcity and utilisation of resources. We must not be satisfied with our growth in various index. Instead we need to improve bureaucratic inefficiency, corruption, lack or poor training, lack of foresight and forecasting ability and lack of coordination amongst the other stake holders.

At the final stage of the research an effort has taken to study the utilisation of other armies in the food security management process. The various nation building activities, MOOTW and In aid to civil power duties of Bangladesh Army are analysed subsequently. We found that Bangladesh Army is a tested organisation which worked for infrastructural development from capital to interior part of the country. Bangladesh Army also have the capability to grow live stocks with its RVFC. The Army owned industries like BMTF, SKS and BDP can contribute by producing modern agricultural equipment, food stuffs etc. From that study we could come to a conclusion that if equipped meticulously Bangladesh Army with its manpower, resources and training can work more for attaining the sustained NFSM with close coordination with MoF, MoA and other government machineries.



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## **Author**

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# PROSPECTS AND CHALLENGES OF DEEP SEA FISHING IN THE BAY OF BENGAL - OPTIONS FOR BANGLADESH

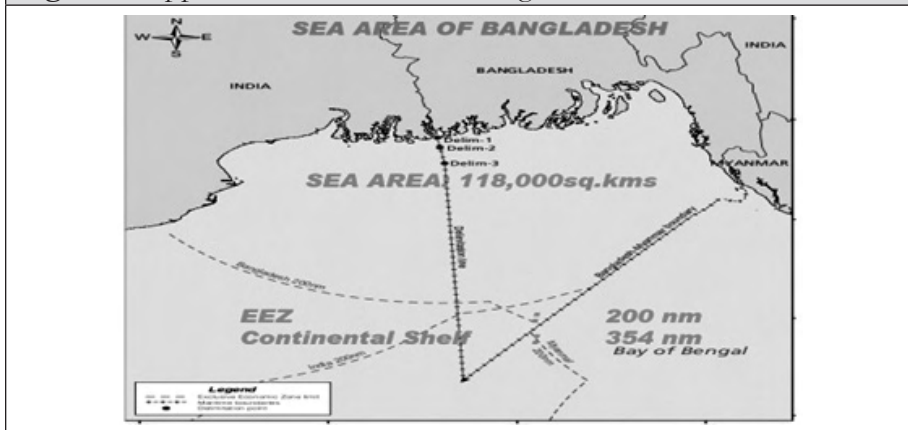
Captain M Sharif Uddin Bhuiyan (S), NGP, ndc, afwc, psc, BN

## Introduction

The ocean covers about 72% of the earth surface. Fish from the ocean is a major source of protein and essential nutrients for a large part of the world's population. According to FAO Project Document -2017, fish accounts for about 17 percent of the global population's intake of animal protein, and 6 percent of all proteins consumed. (FAO-2017).

Bangladesh is one of the marginal coastal country of the Bay of Bengal (BoB) with a long coastline of 710 km. After the recent settlement of maritime dispute with India and Myanmar, Bangladesh has acquired sea area of about 1, 18,813 sq.km which is about 81% of Bangladesh total land area. "We have huge untapped resources in the sea," said M Khurshed Alam, Secretary of Maritime Affairs Unit of Ministry of Foreign Affairs.

**Figure 1:** Approximate Sea Area of Bangladesh



Marine fisheries contributes about 16% of total fish production of the country (DOF, 2016-17). According to Ministry of Fisheries and Livestock (MFL) Annual Report 2016-17, Bangladesh harvested 63,476 MT Marine fish in 2016-17 (DOF-2016-17) and exported fishes and fish products valued BDT 4287.64 crore (MFL Report-2016-17). This sector also enables to earn about 5% of total foreign currency and contributes 3.61% to GDP engaging about 0.5 million coastal population (MFL Report-2016-17). Generally, beyond 200 meter is considered as deep sea fishing zone. Bangladesh still does not have any specific survey in this area nor any deep sea fishing vessel to explore it. However, most of our fishing community usually catches fish within 40-50 meter designated areas and within a distance of 50-60 km from the coast line. It is difficult to explore deep sea fishing areas due to lack of capacity, knowledge, technology, survey, appropriate policy, investment and resources etc. In Bangladesh there are three types of platforms used for sea fishing; mechanized boat, non-mechanized boat and industrial trawlers. There are about 248 industrial trawlers and 67,669 mechanized and non-mechanized boats engaged in fishing (DOF-2016-17). In a survey of marine fisheries it was found that, about 66% of demersal and 57 % of pelagic species are concentrated in the depth range of 0-50 meter (Khurshed 2004). Due to over fishing or exploitation within these zones, the area is facing gradual decrease of marine reserves. This is also a growing concern for Bangladesh (BD). After 1980, there is no authentic survey regarding current fishing reserve. However, Govt has recently undertaken some good initiatives to carry out some survey at BoB. The survey carried out by neighboring countries also indicates the considerable fishing reserve in BD part of BoB. If this could be determined more accurately then, huge economic activities could be generated which in turn would contribute to national economy.

## **Marine Fisheries Environment**

### **Geomorphological Structure of the BoB**

Bangladesh coastal zone includes coastal plains island, tidal flat, estuaries, and offshore waters. The coastal zone is intersected by a vast river network, a dynamic estuarine system and a drainage basin covering also parts of India, Nepal, Bhutan and China draining in to BoB. The land area of the coastal zone is about 42,154 sq. km. The coast of Bangladesh is broadly divided into three distinct geo-morphological regions (National Report on Sustainable Management of the BoB Large Marine Ecosystem {BOBLME}, 2003).

### **Hydrometeorology of the Marine Environment**

The geo-climate environment of the BoB dominated by three main factors (i.) Wind direction, (ii) Precipitation and (iii). River discharge. These factors have a very strong influence on the marine environment, as they affect the water circulation, salinity, productivity and bottom topography, which in turn influence fish distribution and abundance (BOBLME, 2003).

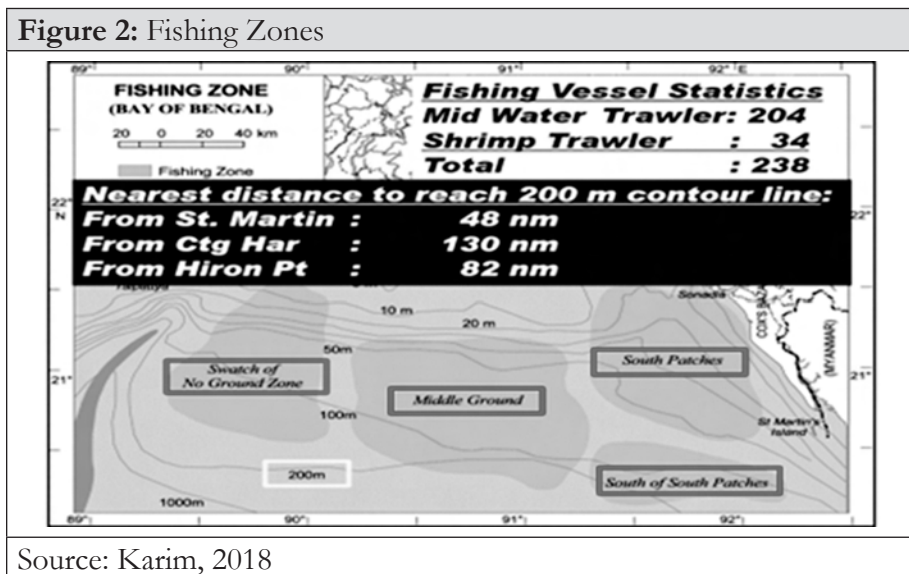
### **Physical Environment-Bottom Conditions**

The area of the shelf zone from 10 m depth to the shelf edge or to the 200 m depth contour is about 40 000 sq.km . There is an area of about 24 000 sq.km which is shallower than 10 m. The traditional fishery is mostly carried out at depths less than 20 m. The shelf area down to about 150 m appeared to be very even. The continental edge is found at depths between 150-180 m. The slope is very precipitous and it seems impossible to carry out bottom trawling in waters deeper than 180 m. (RV Fridtjof Nansen, 1979-80). Besides a conspicuous feature of the western part of the area is the submarine canyon, Swatch of No Ground, reaching depths of more than 800 m. The continental edge is usually found at depths between 160 and 180 m (RV Fridtjof Nansen, 1979-80).

## Fishing Grounds and Establishing of Fish Sanctuaries

There are four major fishing grounds in the marine waters of Bangladesh. South Patches area about 3,400 sq. km and South of South Patches covering an area about 2,800 sq. km, Middle fishing ground covering 4,600 sq. km area and Swatch of no ground covering 3,800 sq. km (Karim 2018). Four different areas in Middle ground and South patches have been declared as 'fish sanctuaries' in the BoB (BOBLME, 2003). The distance from St Martin, Chattogram Harbour and Hiron Point to 200 m contour line are 48 nm, 130 nm and 82 nm respectively. This long distance is also big challenge for deep sea fishing for going to the area also for carrying back fishes in to the shore. In Figure-02, 238 industrial trawlers are considered to be operational among total 248 trawlers.

**Figure 2: Fishing Zones**



Source: Karim, 2018

<b>Table 1: Commercial Fishing Grounds</b>			
Ser No	Name	Location	Major Commercial Species
1.	South Patches	20°10' - 21°40'N 090°10' - 090°50'E	Indian salmon, Hilsa, Pomfret, Ribbon fish, Bombay duck, Eel, Croaker, Catfish, etc.
2.	South-west of South Patches	20°45' - 21°10'N 090°30' - 090°40'E	Pomfret, Red snapper, Croaker, Carangids, Grunter, Ribbon fish, Shrimp, etc.
3.	East of Swatch of No Ground (Middling Ground)	21°00' - 21°25'N 090°00' - 090°40'E	Snapper, Grouper, Croaker, Shrimp, etc.
4	Swatch of No Ground	21°00' - 21°40'N 089°00' - 089°50'E	Hilsa, Pomfret, Ribbon fish, Bombay duck, Croaker, Shrimp, etc.
Source: Arif, 2015			

## Marine Fisheries Reserves

A total of 475 fish species have been recorded from the marine waters of Bangladesh. The fish species are demersal fishes, shallow water estuarine species and some mid-water species. These include about 100 commercial species of which 20 fish families are highly commercial, contributing about 82-87% of the total demersal exploitation. The three most important families are Ariidae (catfishes) contributes 11.99%, Siaeidae (jewfishes) 1.37% and Nemipteridae (threadfin breams) 9% respectively (BOBLME, 2003).





## **Pelagic Fish**

The high concentration of pelagic fish in approximate position N 20° ~ 15° E ~ 91°20' probably consisted of Indian mackerel, *Rastrelliger kanagartha*, settled on the bottom at about 80m. From the Carangidae family *Carangoides malabaricus* is the most abundant species down to 75 m depth, while round Scad, *Decapterus maruadsi*, are dominant at 75-100 m. (RV Fridtjof Nansen, 1979-80). Skipjack tuna is the dominant species not only in number and weight but also be the most important for DGN fishery in the BoB. Most of the capturing fishes were economic species. Bangladesh area seemed to be the richest area with the highest degree of species diversity (BIMSTEC, 2008).

## **Methods of Fishing, Marine Catches and Infrastructure**

### **Exploitation of Marine Fishery Resources**

There is a great potential for marine fisheries in BoB. Due to lack of conservation efforts, the production remained almost static. Only the coastal aquaculture shows an increasing trend. Of the two sub-sectors of marine fishery (industrial and artisanal), the industrial fishery is based on trawl fishery (shrimp trawl and fish trawl).

### **Industrial Fishery**

Bangladesh Fishery Development Corporation (BFDC) took the lead to introduce trawler fleet in the BoB and acted as a pioneer and pathfinder for the private sector and contributed to the scientific exploitation of sea fish/shrimp resources. About 4000 tons of shrimp is caught and exported. Besides, about 20,000 tons fish is marketed locally every year. The industrial fishing is carried out by about 248 trawlers (Department of Fishery (DOF), 2017). These vessels usually operate between 40 m to 200 m depth. But, currently there is no vessel which can operate beyond 200 m, which is actual deep sea fishing area. However, in 2018 Govt has approved

16 licenses (09 Long Liner and 07 Purse seiner vessel). Bangladesh Navy Welfare Trust i.e Nou Kollayan Foundation (NKF), one of its commercial entity obtained approval for 02 Long Liner and 02 Purse Seiner vessel in 2018. Others are private entity.

## **Artisanal Fishery**

Artisanal fisheries consist of about 20,359 mechanised and 16,831 non-mechanized boats operating in coastal waters (Year Book, Statistic, Ministry of Fishery and Live Stock, 2016-17). These vessels usually fish up to 40 m depth. However, both the fisheries (industrial and artisanal) try to exploit coastal and offshore marine fisheries resources without any appropriate management plan. It is mainly due to the non-availability of scientific information and difficulties in enforcement of management strategies.

## **Mariculture**

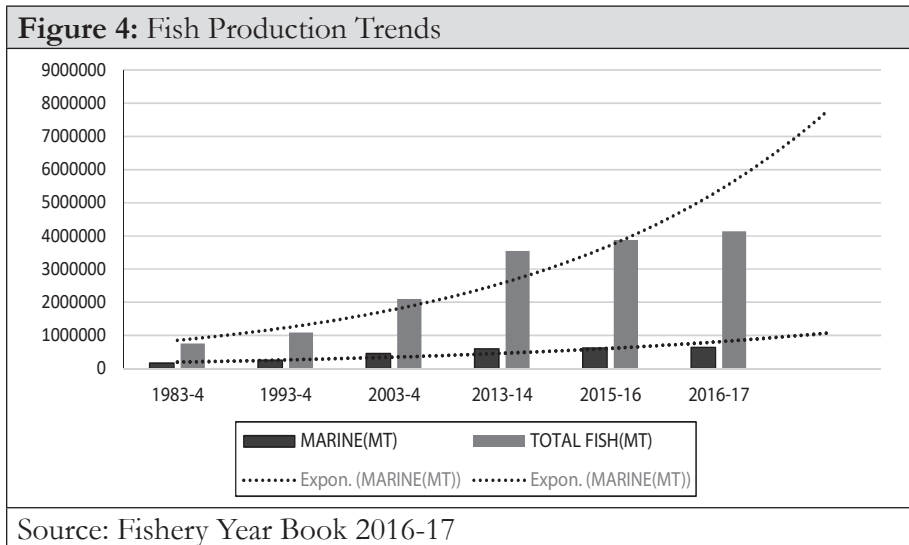
Mariculture is a branch of aquaculture in which aquatic species are raised within the marine environment, i.e in sea water. The country has great potential for the development of fish and other shellfish culture in sea area. Transfer of such technologies available in other countries will greatly assist to develop mariculture for valuable species like sea bass, mullet and non-traditional items like different species of crab, mollusk and seaweed. (W H Kutubuddin, National Blue Economy Cell on 12 May 2018) Countries like China, Japan, and Vietnam have great success in this sector.

## **Fishing Gears Used**

Bangladesh uses different innumerable fishing gears to exploit marine fishes. The major fishing gears in operation in the coastal and offshore waters of the BoB are gill nets (drift and fixed). Set bag nets (estuarine and marine), Trawl net (Shrimp and fish), Seine net, Push net, Trammel net, Hook and Line, Traps, etc. Drift Gill Nets (DGN) are dominated in inshore areas and specially for fish Hilsha species.

## Marine Catches

The marine fishing catches are increasing gradually. According to the Fishery Statistics Year Book 2016-17, in 2005-6, Marine Industrial (MI) and Marine Artisanal (MA) had been 34,084 MT and 4,45,726 MT respectively. Whereas in 2016-17, MI and MA were 1, 08,479 and 5,28,997 MT total marine catches 6,37,476 MT. Total fish catches i.e capture, culture and marine was 41, 34,434 MT. So, marine fishes contributed 15.41% and fresh water fishes 84.59% (Year Book, 2016-7). Among total marine catches Industrial Sector contributes 17% and Artisanal contributes 83%. So, there is huge opportunity for Industrial sector. The Figure below shows the fish production trends. Since 1983 the production is growing exponentially but the marine fish catches are not increasing in the same paces. Therefore, more attention is required in to this sector.



<b>Table 3: Types Fishing and Gears</b>				
SL No	Type of Fishing	No of Trawler/Boat	Unit (Gear/ Net)	Catches(MT)
1.	Industrial	248	744	1,08,479
2.	Artisanal:	37,190	1,18,353	3,56,100
	MB	20,359	77,768	3,14,100
	NMB	16,831	40,585	42,000
3.	Set Bag Net Fishing	-	-	1,46,097
4.	Long line Fishing	-	-	16,050
	<b>TOTAL</b>	<b>37,438</b>	<b>1,19,097</b>	<b>6,37,476</b>

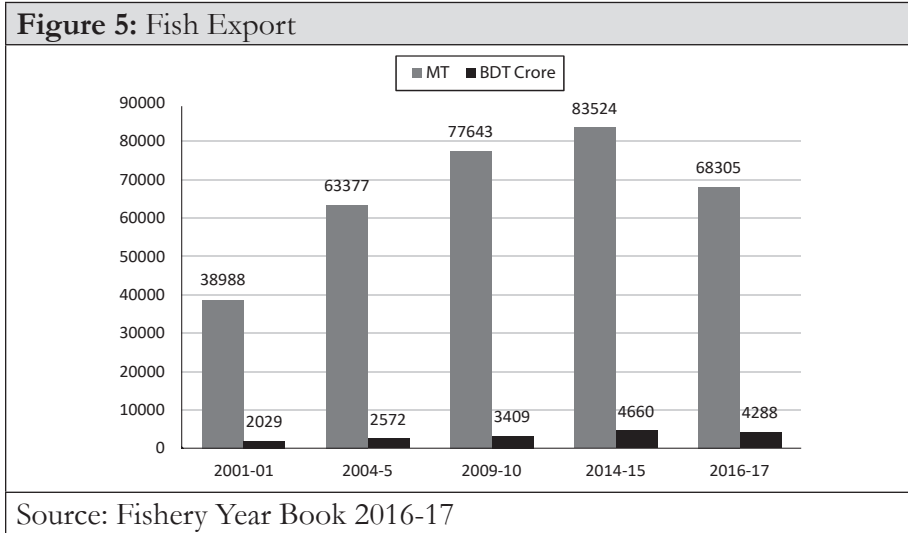
Source: Fishery Statistical Year Book 2016-17

<b>Table 4: Marine Fish Production Trend (1983-2017)</b>				
SL No	Type of Boat	1983-84 (MT)	2016-17(MT)	Growth
1.	Marine Industrial(MI)	14,500	1,08,479	2.97%
2.	Marine Artisanal(MA)	1,50,582	5,28,997	1.50%
	Total	1,64,882	6,37,476	1.75%

Source: Fishery Statistical Year Book 2016-17

### **Fish Exports Trends (2001-2017)**

According to the Statistical Year Book 2016-17, total fish exports were 68,305 MT in value BDT 4287 crore which is about 1.51% of total export. Among this export, shrimp was 39,705 MT and BDT 3,682 crore. (Year Book, 2016-7). It appears that, shrimp export is about 58% of total fish export which contributes to 85% in terms of export value. However, in 2000-1, total export were 38,988, BDT 2032 crore. So, during the last 15 years there was growth 1.75% and in terms of value it was 1.81% which is insignificant. On the other hand, in 2000-1, fish export was 5.77% of total export



But in 2016-17 it was reduced to 1.51%. So the export pie for fishes is reducing (Year Book, 2016-17). Since there is a growing demand abroad, therefore, BD should put special focus on sea fish and processed sea food products export.

## Infrastructures

### Fishery Administration and Institutions

**Fishery Administration.** The Government administers both marine and inland fisheries by Ministry of Fisheries and Livestock (MoFL). The main public sector agencies are the Directorate of Fisheries (DoF) and the BFDC.

### Fishery and Human Resource Development

**Research:** Fisheries research are undertaken independently by the Marine Biological Laboratory, Chattogram, Fisheries Technological Research Station, Chandpur; Freshwater Fisheries Research Station, Chandpur; and Aquaculture Experiment Station, Mymensing.

**Universities:** Currently there are number of Universities which are providing academic education on oceanography and marine resources. Bangabandhu Sheikh Mujibur Rahman Maritime University (BSMMRU), Bangladesh Agricultural University at Mymensing, Universities of Chattogram, Dhaka and Rajshahi have their own academic program in the fisheries field.

### **Marine Fisheries Academy**

For developing marine fishery human resources Marine Fisheries Academy (MFA) was established on 1st September 1973 as sister concern of BFDC. So far about 1500 cadets in different trades (up to 34th batch) have successfully passed out from MFA since inception. Among those about 850 cadets are now serving in international maritime sector earning huge foreign currencies (Capt M H Ahmed, Commandant, MFA).

### **Fisheries Corporations**

BFDC was established in 1964 for purposes of strategy development of the fishing industry of Bangladesh. “Fishing industry” includes also fish processing and marketing. The Corporation has the power to establish units for fishing, preservation, processing, distribution and marketing of fish and fish products (Razib, 2007).

### **Deep Sea Fishing Industry**

Industrial trawlers are main platforms for fishing up to 200 m area. For importing deep sea fishing trawlers, foreign investment etc are regulated by Bangladesh Investment and Development Authority (BIDA). At this moment, there is no authorized vessel which can go beyond 200 m for deep sea fishing.

## Platforms and Technology

### Types of Fishing Trawlers in Bangladesh

There are different types of fishing trawlers currently used in Bangladesh; Industrial and Artisanal; Mechanized and non mechanized (MFA, 2018)

<b>Table 5: Present Size of Industrial Trawlers</b>			
Type	No.	Mesh size	Engine power
Shrimp	37	45-300mm	50-500
Bottom	60	60-300mm	250-900
Mid-water	103	60-1600mm	600-1850
Trial Trip	4860	300mm	250-500
Source: Mr Humayun, 2016			

Total 248 industrial trawlers are permitted to fish in the area between 40m to 200m depth. Currently, there is no deep sea fishing activity in the BoB which is beyond 200m depth. Govt has recently sanctioned 16 long liners and purse seiner for deep sea fishing.

### Deep Sea Fishing

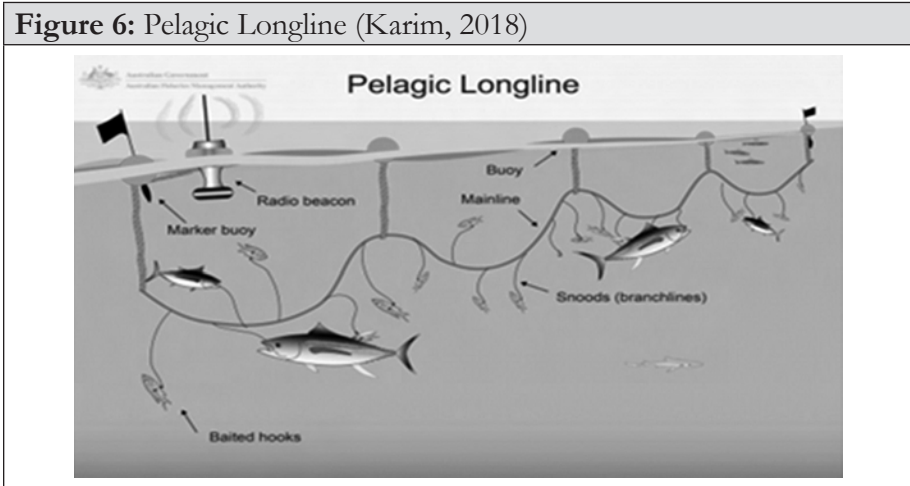
For deep sea fishing, there are two types of fishing vessels .i.e Long Liner and Purse Seine vessel around the world.

### Long Lining Fishing

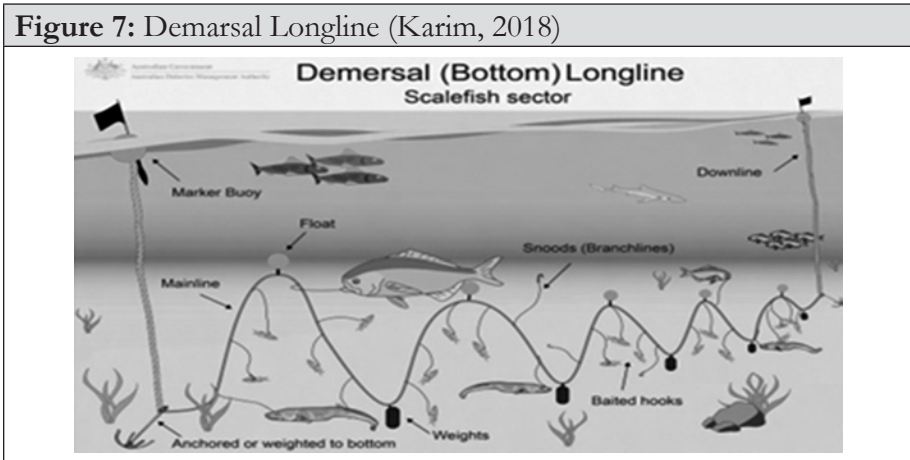
Longline fishing, or long lining, is a commercial fishing technique. It uses a long line, called the main line, with baited hooks attached at intervals by means of branch lines called snoods. Long lines are classified mainly by where they are placed in the water column. This can be at the surface or at the bottom (Wikipedia). Longlines can be set to hang near the surface (Pelagic longline) to catch fish such as tuna and swordfish or along the sea floor (Demersal longline) for ground fish such as halibut or cod.



**Figure 6: Pelagic Longline (Karim, 2018)**



**Figure 7: Demersal Longline (Karim, 2018)**



## Per Seine Fishing

Seines have been used widely in the past, including by stone age societies. Seine fishing (or seine-haul fishing) is a method of fishing that employs a fishing net called a seine. Seine nets can be deployed from the shore as a beach seine, or from a boat. Boats deploying seine nets are known as seiners. Purse seine fishing can result in smaller amounts of by-catch (unintentionally caught fish) (Greenpeace, 21 May 2010). Use of purse seines is regulated by many countries. In Sri Lanka, using this type of net

within 7 kilometers of the shore is illegal (Colombo Page, 21 October 2013). Purse seine fishing can have negative impacts on fish stocks because it can involve the by catch of non-target species and it can put too much pressure on fish stocks.

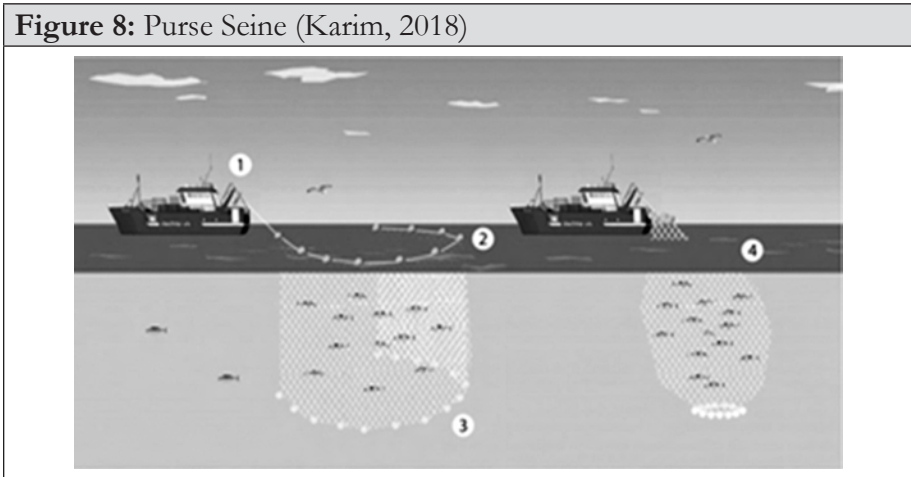
## Types of Seiner

Two types of seine net deployed from seiners:

- Purse seines
- Danish seinesseiners

## Purse Seine

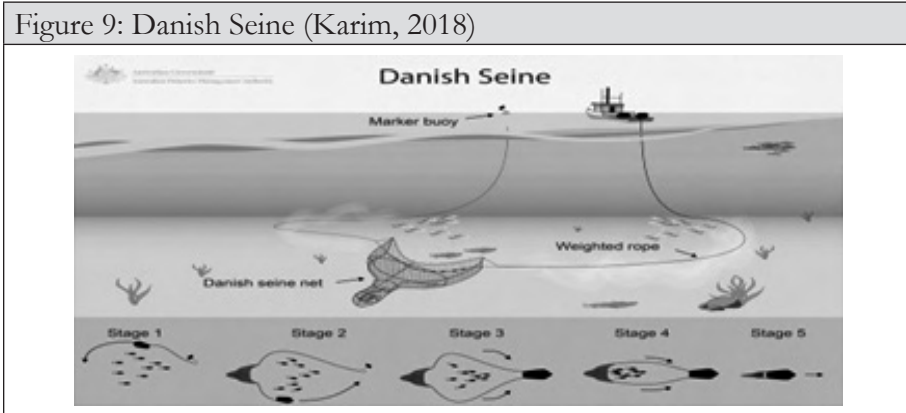
**Figure 8:** Purse Seine (Karim, 2018)



A common type of seine is a purse seine, named such because along the bottom are a number of rings. This operation is similar to a traditional style purse, which has a drawstring. The purse seine is a preferred technique for capturing fish species close to the surface: sardines, mackerel, anchovies, herring, and certain species of tuna and salmon .

## Danish Seine

Figure 9: Danish Seine (Karim, 2018)



A Danish seine is similar to a small trawl net, but the wire warps are much longer and there are no otter boards. The seine boat drags the warps and the net in a circle around the fish. The motion of the warps herds the fish into the central net.

## Rules, Regulations and Policies

### International Legal Frame Work for Maritime Sectors

The World Summit on Sustainable Development (WSSD) (UN, 2002) set clear and time-bound targets for member countries to implement sustainable fisheries and sustainability targets. Target 6 specifically addresses fisheries. Several SDGs also address sustainability challenges relevant to fisheries. These are particularly prominent in the ten targets of Goal 14 (FAO, 2017).

### Government Existing Rules, Regulations

**Existing Rules and Regulations for Marine Fisheries Resources:** The parent law is the Marine Fisheries Ordinance of 1983 and supplemented by Marine Fisheries Rules. However, Rules, Regulations and ordinance related to marine fisheries are given below:

- Marine Fisheries Ordinance, 1983
- Marine Fisheries Rules, 1983
- Shrimp Culture Users Tax Ordinance, 1992
- Protection and Conservation of Fish Rules, 1985
- Ordinance to provide for the establishment of a Fisheries Research Institute, 1984
- Protection and Conservation (Amendment) Ordinance 1982
- Territorial Waters and Maritime Zones Rules, 1977
- Allocation of functions to the Ministry of Fisheries and Livestock
- Bangladesh Fisheries Development Corporation Act, 1973
- Government Fisheries (Protection) Ordinance, 1959
- Protection and Conservation of Fish Act, 1950.

Marine Fisheries Ordinance (1983) is implemented by the DoF. This is supported by a series of rules (Marine Fisheries Rules, 1983) and supplemented periodically by Bangladesh Gazettes. The MFO (1983) is applied between the baseline (10 fathoms or 18.29 m) and 40 m (for the artisanal fishery) and beyond the 40 m depth contour (industrial fisheries) (Arif, 2015) Industrial trawlers often violets it.

## **Regulations and Enforcement**

### **MFO and its Legal Implication in the Marine Fisheries Management**

The MFO makes provisions for management, conservation and development of marine fisheries which is applicable to waters deeper than 40 meters. However, proper survey is yet to be made for effective exploitation of pelagic resources in EEZ (Razib, 2007). It is difficult to formulate effective policy and strategy without adequate information about standing stock of fish and fish habitats.

## **Legal Enforcement**

The local administration enforces laws, rules and policies. The Upazila administration might undertake shore-based enforcement programs and data on movement of vessels and use of gears by non-mechanized artisanal sectors. These are to be collected and monitored (Razib, 2007). Sea-based enforcement is the responsibility of Coast Guard (CG) and Bangladesh Navy (BN) with the support of the DOF.

## **Ensuring Safety at Sea**

Major provisions of regulating the fishing fleet must promote “Safety at Sea”. The DOF prior to issuing licenses required special awareness about lifesaving equipment. In line with this, all registered and certified boats must carry lifesaving equipment for each crew member. All vessels falling under the mechanized commercial boats should be equipped with radios and transponders.

## **Policy Framework**

In 1998, a National Fishery Policy was drafted and approved by the Government. Detailed deep sea fishing policy is yet to be formulated and implemented. Since this type of fishing needs huge investment, local investors may face difficulties. Therefore, conducive policy for foreign investment in terms of joint venture needs to be formulated earliest. Above all, enforcement of policy remains to be a challenging task in this sector.

## **Enforcement Relating to Marine Fisheries**

With limited resources, Coast Guard could employ 3,339 personnel to safeguard the coastal population and fishery communities. This population is safeguarded by 12 ships/crafts in 34,000 sq. km area. It appears that, one CG person takes care of 7500 fishermen and 15000 coastal people, which is very limited (Ministry of Planning, 2016).

Besides, Govt can take support of BN to facilitate the enforcement with the followings: (Mahbub, 2017)

- BN ships may actively take part in regular scientific data collection on various aspects of the Blue Economy activity.
- BN Hydrography may develop resources map of the BoB from real-time scientific information.
- BN may facilitate training activities on deep-sea living resources harnessing to expedite sea resources.
- BN may consider for facilitating commercial deep sea tuna fishing from the continental shelf of the BoB.

## **Socio-Economic Overview –Prospects and Challenges**

### **Socio-Economy**

BD coastal area lies in 19 districts covering 47,201 sq. km which is 32% of the land area. Out of 19 districts, 12 districts (48 Upazila) are directly engaged with the sea related businesses. Density of population is 482 person/sq. km. Out of 30 million population in coastal area, only 15 million are engaged with sea related activities for their livelihood (Ministry of Planning, Maritime Resources Documents 2016).

### **Prospects of Deep Sea Fishing**

There are enormous living and non-living resources in the BoB. Among the living resources; 475 species of fishes, 36 types of shrimps, 5 types of lobsters, 15 types of crabs, 351 types of snails and mollusks, 33 types of sponges, 56 types of algae and corals, etc are there. Due to the permanent settlement of maritime boundary disputes, the opportunity also largely increased (MoFL).

BD traditional fisherman currently explores fishing up to 40m depth. Industrial trawlers (i.e 248) fishes 40 to 200m but beyond that the area, is yet to be explored. BD has about 35,000 sq. km up to 40m depth. But beyond this zone upto continental shelf, huge area is yet to be explored .

Surveys by R.V. Fishery Research No-2 (1979) and R.V Dr. Fridtj Nansen (1979-1980) indicate presence of some species of tunas and tuna like fishes in the EEZ of BD. Most abundant species as’ per R. V. Fishery Research No 2 occurring mostly more in the 28-31m in depth area (N 21 -15.00, long E 90-22.00) (Fridtjof Nansen, 1979-80):

- Spanish Mackerel (S. commerson)
- Frigate tuna (A. thazard )
- Long tail tuna (I. tonggol )

The other survey indicates that, the feasibility of catching tuna near the EEZ of BD (latitude 16°N -19°N, longitude 88°E -91 °E) particularly skipjacks with DGN (BIMSTEC 2008). Besides, major catches of BD trawlers are white fishes which are as follows (Humayun-2016):

- Sardines/Rainbow sardines : 30%
- Breams/red fish : 10%
- Mackerels : 9%

BD can catch fish from up to 660 km from the BoB but its trawlers catch fishes mainly from 60 km owing to lack of capacity. For instance, in 2016 the country caught only 95,000 tons of fish in contrast to 8 million tons by India, Myanmar, Sri Lanka and Thailand from the BoB. Bangladeshi trawlers accounted for 11 percent of the total catch last year (Daily Star 2017).

“We have huge untapped resources in the sea,” said M Khurshed Alam, Secretary of Maritime Affairs Unit of the Foreign Affairs Ministry. The average depth of the BoB is 2,500 meter. And yet, there is hardly any capability of catching demersal fishes beyond 50 meter depth of water. Long line fishing is totally absent in deep waters, he said (Daily Star 2017).

There is tremendous scope for increasing marine catch by introducing technology, long line and incentives for bigger ocean going trawler, (Alam, 2017). The global population will be 9 billion by 2050 and 100 million tons of additional fishes will be needed by that time. “It will be good if we can catch at least 5 million tons of fishes from the sea.”(Daily Star 2017). Deep sea fishing can generate huge economic benefits to nation But it requires appropriate technology, knowledge, skilled man power, investment etc (Alam 2018).

## **Global Fishing Scenario**

According to FAO (2016), global fish production has been increasing over the years and has reported 167.2 million tonnes by end of 2015. Capture fish production has contributed 55% to the global fish production in the same year.

## **Marine Fishing- Japan**

Japan is one of the world's largest consumers of sea fishes, consuming 7.5 billion tons of fish a year which is about 10 percent of the world's catch. Per person consumption is about 30 kg a year. Scandinavians consume only around 15 kg per person as the next highest consumer. The Japanese consume so much fish that Japan has traditionally controlled the world market for seafood.

Japan has about \$14 billion commercial fishing industry. There are around 200,000 fishing vessels in Japan. ([https://en.wikipedia.org/wiki/Agriculture,\\_forestry,\\_and\\_fishing\\_in\\_Japan](https://en.wikipedia.org/wiki/Agriculture,_forestry,_and_fishing_in_Japan)).

## **Marine Fishery- Sri Lanka**

Sri Lanka has exclusive fishing and economic rights for an ocean area of 500,000 sq. km and a coastal line of 1700 km in addition to inland water bodies, which makes fishery to be one of the promising industries in the



country. Fisheries industry of the country contributes 1.3 percent to the total Gross Domestic Production (GDP). The marine fisheries, Deep-sea and Coastal, contribute about 86% (456,990 MT) to the total fish production of the country in 2016. The major export destinations for Sri Lankan fish and fishery products are Europe and America.

## **Challenges Faced in Exploring Deep Sea Fishing**

There are various challenges for deep sea fishing in the BoB:

- **Overfishing and Biodiversity Decline:** There is over exploitation and indiscriminate fishing up to 40 m depth by artisanal and industrial trawlers. Due to the over fishing, fishing stock and biodiversity is declining at faster rate affecting future sustainable growth.
- **Inadequate Survey:** Lack of exploratory survey on stocks assessment in the deep sea beyond 200m is still a need of the time. Although there have been some limited scale survey like Norwegian Survey, BIMSTEC Survey, IOTC Survey etc within 200 m depth but those data are yet to be utilized and disseminated to the stake holders and potential entrepreneurs for determining economic feasibility.
- **Feasibility on Economic Viability:** Entrepreneurs need to know economic viability, its future prospect for any types of investment. Proper economic feasibility study and access to those information to encourage potential entrepreneurs is essential.
- **Technology and Platforms:** There is a lack of proper technology to explore deep sea i.e beyond 200 m. There is no deep sea fishing platforms currently. There is hardly any modern technology for harvesting, storing, processing and marketing sea fishes.
- **Knowledge and Skilled Manpower:** Fishing community and stake holders lacks in appropriate knowledge and skill to explore and develop this sector. For deep sea fishing people needs special training, skilled manpower which should be started as soon as possible.

- **Policy Support and Enforcement of Laws:** For deep sea fishing, currently there is need for detailed policy for Govt. Conducive foreign investment support policy is essential to grow this sector. Liberal banking support is essential for this sector. There is lack of strict enforcement of law as per Marine Fisheries Ordinance. Besides, some special terms and conditions for joint venture with foreign countries does not seem to adequately encourage entrepreneurs (Alam, 2018). Appropriate Govt policy support is a requirement for growth of this sector.
- **Lack of Awareness:** There is sea blindness among the general publics in BD. Sea being out of the tangible visibility, it creates a phobia in to mind set of the people (Alam 2018). It requires deliberate ways and means to create awareness primarily through the Government bodies followed by NGOs, medias and other stakeholders.
- **Research and Education:** Although Govt has limited facilities to carry out research but has limitations in modern technology. Different public universities have limited fishery faculty. Promoting such education and research may boost developing this sector.
- **Limited Infrastructures:** Govt has limited infrastructures in terms of supervision, monitoring, survey, dedicated department for marine fisheries, landing stations, storage and processing facility, research centre etc.
- **Illegal Fishing:** Entry of illegal fishing vessels and pouching in our EEZ has been a common phenomenon. However, it has been reducing due to effective surveillance by BN and CG round the year.
- **Marine Pollution:** Marine pollution is causing serious impact in the BoB and to human lives. Millions of tons of plastics, oil spill, industrial pollutants, and different wastes making the sea increasingly dangerous for the marine living resources specially fishes.

- **Poor Fishing Community:** Fishing community live a very modest life facing different challenges like; piracy, safety hazards, lack in storage facilities, in adequate access to fund, exploitation by middle man, price hikes of essential items like fuel etc. Restriction in fishing atsea every year for about two months make their life more difficult due to lack of day to day earnings.
- **Weather Condition and Climatic Changes at BoB:** Generally rough sea condition often prevails at BoB round the year specially from April to September. Besides, there are regular occurrence of cyclone, storm, depressions and many fisherman loss their lives. Due to climatic changes, temperature rising, changes in salinity at different depths and water nutrients contents, fishes are migrating to different places.
- **Long Distance for Deep Sea Fishing:** For deep sea fishing, 200 m contour line is far away from the shore which ranges from 48 to 130 nm. In many countries it is far closer to the shore like Sri Lanka. It reduces cost and effort. It is a significant challenge for reaching and bringing back fishes to the shore for further process in BD.
- **Access to Fund:** Existing banking system do not have easy options to offer that can facilitate to develop business for marine sectors in general. For deep sea fishing sector there is no bank in BD, which can offer attractive investment packages. A newly built deep sea fishing trawler may cost BDT 150 to 250 crore depending on the capacity and size. Therefore, it requires easy access to fund. Govt may consider dedicated bank like Maritime Bank for such sector where Bangladesh Navy is trying to work. Bangladesh Bank may also consider some financial options to ease the investment for deep sea fishing.
- **Implementation:** There is limited holistic and effective approach to explore and exploit sea resources specially deep sea fishing. However, Govt has recently taken some good initiatives determining, short, medium and long term plan for exploring potentials of Blue Economy including deep sea fishing in brief. But it needs to be implemented within the stipulated time frame as planned.

## **Way Forward**

To explore, conserve and manage the marine fisheries resources specially the deep sea fishing in the BOB, following may be considered as way forward:

### **Short Term Strategies**

The short term strategies may be:

- Govt may take extensive awareness program and initiatives to promote potentials of sea resources especially deep sea fishing in the BoB to the public and specially focusing new entrepreneurs.
- Attractive financial incentives may be offered by the Govt and financial institutions to the entrepreneurs for investment in to this sector and for promoting exports. Easy access to fund and dedicated bank for maritime sector is essential to grow this sector.
- All out efforts may be made for promoting regional and global cooperation for maritime sector specially deep sea fishing. Joint venture investment from abroad should be encouraged with reasonable terms and conditions.
- Efforts may be made for detailed survey and stock assessment of BD EEZ to explore new fishing grounds and determine fishing stock with joint survey effort from abroad at the earliest.
- Strict enforcement of all relevant Acts, Rules and Regulations to be ensured by all agencies like DOF, BN, BCG etc.
- Impose restrictions during breeding period effectively. Fishing community should be taken under safety net to ensure their comfortable livelihood during that period.

## Mid-Term Strategies

The mid-term strategies may be :

- Appropriate policies may be developed to formulate marine fisheries development strategies specially deep sea fishing and improve effective management system for the future.
- Govt research institutes including private think tanks may be engaged to carry out extensive research on sea resources specially on deep sea fishing to reap economic benefits of Blue Economy including issues like Biodiversity, Climate Changes etc.
- Monitoring, surveillance and evaluation system may be developed to track the performance of the marine fisheries sector such as, catch level, level of stock/reserve, illegal poaching etc.
- Rules, regulations and policy may be updated to create investment friendly environment through policy options, developing facilities, support and enforcement of law for deep sea fishing.
- Deep sea fishing beyond 200 m and across the EEZ maybe promoted to explore and exploit tuna, tuna like and other pelagic fishes by collaborative effort.
- Skilled human resources need to be developed on priority basis at all levels of this sector with the support of universities, MFA, DOF and from friendly countries.
- MoFL may actively consider to provide BN with oceanography platform with required manpower to carryout survey and research in the BoB. To ensure proper conservation, monitoring and safe guarding of fishery and fishing community, Coast Guard may be equipped accordingly.

## **Long -Term Strategies**

The long term strategies may be following:

- National Marine Fisheries policy and National Ocean Policy may be formulated earliest.
- Steps may be taken to control marine pollution to restore and conserve bio-diversity.
- Introduce air surveillance effectively to control poaching, illegal entry of foreign fishing vessels in EEZ and deep sea fishing area.
- Develop appropriate research facilities to explore and exploit marine resources specially for deep sea fishing for national economic benefit. Govt may take necessary steps to make the National Oceanography Research Institute functional.
- Marine Affairs Division may be formed incorporating a Maritime Cadre Service to focus on Blue Economy and effectively exploit its potentials as new economic front contributing to national economy.
- Govt may consider to include blue economy/ocean issues in the Secondary School Curriculum to develop the mindset of future generation towards the enormous potentials of the sea and sea resources.

## **Conclusion**

BD has been a sea faring nation since ancient time. The country has won 1, 18, 813 sq. km of area after delimitation maritime boundary with Myanmar and India in 2012 and 2014 respectively. The huge sea area is about 81% size of land area which is full of living and non-living resources. Among the living resources about 475 fishing species are there. But unfortunately BD is not in a position to extract these resources for economic benefit.

Currently, up to 40 m, artisanal boats do fishing their and 40m to 200m by industrial trawlers. However, beyond 200 m is deep sea fishing area. There is no deep sea fishing vessel currently operating in Bangladesh. Marine fishes contribute to 10 to 15 percent of total fish catches in BD.

There was survey by Norwegian team, back in 1979-80 and by BIMSTEC in 2000, which provides some information about marine environment and fishing species at various depths at BoB. However, for deep sea fishing survey beyond 200m depth is yet to be done properly. If the survey data and stock position are properly determined, then potential entrepreneurs will find more interest for investment in this sector.

BD seriously lacks in technology, skilled human resources at all levels, investment and efforts to grow new entrepreneurship. Beyond 200 m depth remains as potential sector for deep sea fishing. There are different many types of demarsal and pelagic fishes in BoB. Such as Tuna, Sardines/ Rainbow sardines, Breems/red fish, Mackerels and shrimps etc which has good commercial value in the international market. However, due to over fishing in 40m depth fishes with bottom trawling, all types fishes including fish fries are declining fast.

There is limitations in enforcement by different Govt agencies. Coast Guard and BN need to be well equipped to ensure safe fishing and prevent illegal fishing at BoB. Govt has recently formed a high powered committee under the leadership of Honorable PM to steer Blue Economy in right direction.

Govt needs to focus on immediate survey, encouraging entrepreneurs through different incentives, joint collaboration, technology transfer from countries like Japan, China, Thailand etc. BD may take support from FAO and IOTC as well. Govt needs to provide pragmatic policy support, invest in applied research, human resources, infrastructural development, easy access to finance, technology transfer, quality assurance and international compliances etc on priority basis for deep sea fishing. Besides, existing fishery sector should be brought to discipline and enforcement through the existing law by DOF, BN and BCG.

As a whole, the marine sector is a green field with huge potentials but the country needs a holistic approach from the top to create public awareness and facilitating in exploiting the sea resources especially for the deep sea fishing. Future of BD lies not only on land but more on the unexplored potentials of BOB.

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## **Author**

Captain M Sharif Uddin Bhuiyan was born on 04 April 1967. He was commissioned in the Supply Branch of Bangladesh Navy on 01 January 1988. Besides his operational appointments as Staff Officers at Area Levels and Supply Officer on board ships, he commanded Naval Stores Depot, Chittagong, largest logistics depot of Bangladesh Navy. He also served as Director Finance, Director Naval Education, Director Naval Training and Deputy Judge Advocate General in the Naval Headquarters. He is a graduate from National University, Chittagong University, Bangladesh and post-graduate in MBA from Preston University, USA. He attended number of courses at home and abroad including Long Logistics Management Course from India. He has served in UN missions in Liberia as Staff Officer at Forces Headquarters. He visited many countries across the globe. His hobby is travelling, reading books.

# **DEVELOPING HUMAN RESOURCE FOR AVIATION SECTOR: ROLE OF AVIATION UNIVERSITY OF BANGLADESH AIR FORCE**

**Air Commodore Md Shaharul Huda, ndc, psc, GD(P)**

## **Introduction**

Human resource is the most valuable resource of any nation. If human resource is at the heart of a nation, our colleges and universities are its circulatory system, pumping knowledge and wealth and well-being around the country, sustaining and maintaining its health and ensuring a living, productive nation. Investment in education will accrue return through better job and better income. New colleges and universities play a critical role in country's economic growth through the production of skilled human resource in important occupations. As the country progresses towards achieving Sustainable Development Goals, we will need new professionals across all sectors including Aviation.

Bangladesh since 2007 has had more people of working age than non-working, known as demographic dividend. By 2040, this opportunity to accelerate economic growth would reduce (Liton & Molla, 2017). Despite having this demographic advantage, Bangladesh could not exploit the potential fully as she could not create enough job for this working-age population. The academics have suggested to take various measures including large-scale investments in education sector. Many Asian countries have invested significantly in human resource development, especially in education and health sector, to achieve higher economic growth rate during their time of demographic dividend. Bangladesh added 4 million jobs between 2010 and 2013, but the trend declined and only added 1.4 million jobs between 2013 and 2015 (Liton & Molla, 2017). Government of Bangladesh (GOB) has also identified education being the main source of human resource development to reap the benefit of demographic

dividend. Aviation sector is identified globally as one of the growing sectors and the prospect of growth is even higher in Asia-Pacific region. This growth prospect is indicative of increased global employment opportunity. Bangladesh is in appropriate position to capitalize this opportunity.

International Civil Aviation Organization (ICAO) forecasted that the growth of global passenger would be doubled by 2030 than that of 2013. Such global trend of aviation will definitely create ample opportunities on the aviation sector of Bangladesh being located in a strategic aviation hub at the cross road between Europe, Middle East and Asia Pacific. Asia Pacific region is expected to become largest air transport market of the world within next 10 years' time. It is therefore felt that the country should develop her human resource in aviation sector. GOB has already planned to establish Aviation University to function as the apex institute in organizing, synchronizing and developing adequate human resource to meet the global need.

## **Overview of Aviation Sector**

**Global Air Travel Demand:** In 2012, the worldwide air traffic was more than 5.7 billion passengers, which was 4.4 percent higher from previous year. In 2013, it increased to 6.3 billion. In 2013, airport traffic grew at 8.7% in developing economies while it was 1.8% in advanced countries. In 2013, highest air passenger movement was through Asia-Pacific region. In the same year, Asia-Pacific region handled the largest amount of air cargo (Ahsan & Hassan, 2015). Aviation's global economic impact (direct, indirect, induced and catalytic) is estimated at US\$ 2.2 trillion, equivalent to 3.5% of world Gross Domestic Product (GDP). The air transport industry generates a total of 57 million jobs globally (Airbus, 2014). Such global trend of aviation will definitely create ample opportunities on the aviation sector of Bangladesh.

**Air Travel Demand in Bangladesh:** Bangladesh is a small country where the distances between major cities are not large enough for air

transportation to be very effective. But highly congested and accident-prone roadway and inefficient and slow railway and water ways as well as imbalanced socio-political conditions of the country, people are now becoming interested towards air travel. According to official statistics about 10.08 million Bangladeshis are living and working abroad. They are also the element of growing passenger movements (Haque, 2018). Again due to economic and business growth, Bangladeshis are also travelling to international destinations in great numbers. At present, aggregate global growth in passenger movement is 4.4% and in Asia Pacific region it is 8.7%. But for Bangladesh the growth rate is 9.9% which is almost double in comparison to global growth. In the cargo movements also similar trend is observed. Global annual growth for cargo movement is 0.9%, Asia-Pacific region is 2.1%. But for Bangladesh it is 7.4%. Accordingly, the aircraft growth rate is 2.9% where the global aircraft growth is only 0.6% (Ahsan & Hassan, 2015).

**Aviation Growth Trend in Bangladesh:** Bangladesh has huge air transportation potential. By 2032, Dhaka will be the 90th aviation megacity of the world. Airbus global market forecast 2014 projects 7% growth of overseas and domestic passengers to and from Bangladesh by 10 years (Airbus, 2014). 90% of Bangladesh Aviation Market is orientated towards International. It also highlighted that the air traffic will be double in next 15 years (Lange, Bob; Airbus, 2014). The country has some inherent advantage over other countries. Large population base, more than ten million people working outside the country and more than one million people visit Saudi Arabia for performing hajj and umrah every year (Haque, 2018). This has made Bangladesh a lucrative destination for many foreign airlines. According to CAAB, the combined annual market size of 2014 was worth US Dollar (USD) 440 million, with 5.8 million passengers and 2.3 lakh tons of cargo (Kabir, 2018).

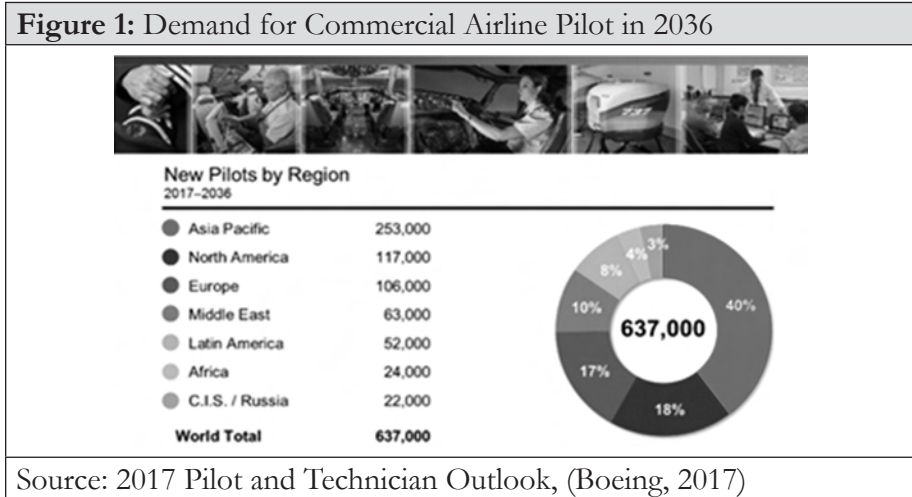
## **Prospect for Skilled Human Resource in Bangladesh Aviation Sector**

Bangladesh has witnessed an average GDP growth rate higher than 6% for last 10 years (World Bank, 2018). Moreover, per capita Gross National Income (GNI) has reached to 1465 USD in 2015-16 (BBS, 2015-16). Such development has fueled a rise in aviation sector. In about 10 years, Asia-Pacific region is likely to become the largest air transport market in the world. All these suggest that aviation sector of Bangladesh has significant prospect in future. Some of the prospects are elaborated below.

### **Developing Highly Skilled Manpower for International Market.**

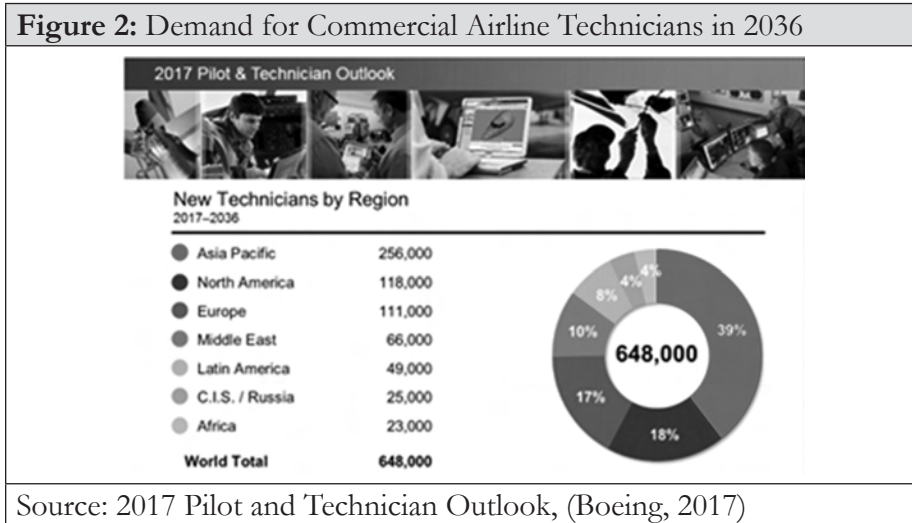
ICAO long-term air traffic assessment predicts that by 2040 the airline passenger movement will grow to about 10 billion from 3.8 billion carried in 2016. Asia-Pacific remained the largest region with 33 per cent of world traffic with 10.2 per cent growth in 2016 (ICAO, 2018). This phenomenal growth will require 6,37,000 commercial pilots globally and 2,53,000 in the Asia-Pacific alone. (Boeing, 2017). Boeing forecasts that there would be requirement of 6,48,000 commercial airline technician, out of which Asia-Pacific would need 2,56,000 alone. (Boeing, 2017). The aviation sector of Bangladesh has good prospects due to three important reason. Bangladesh is located at close proximity of the market (Asia-Pacific region), the medium of teaching is english, and the skilled manpower of this region is happy with comparatively lower wages (Bakaul, 2016).

**Figure 1: Demand for Commercial Airline Pilot in 2036**



Source: 2017 Pilot and Technician Outlook, (Boeing, 2017)

**Figure 2: Demand for Commercial Airline Technicians in 2036**



Source: 2017 Pilot and Technician Outlook, (Boeing, 2017)

**Providing Skilled Manpower for Domestic Civil Aviation Sector.** The passenger and cargo movement in aviation sector of Bangladesh is forecasted to increase from 5.8 million and 2,30,000 metric tons in 2013 to 10.2 million and 3,60,000 metric tons in 2020 (Siddique, 2016). From 2010 to 2013, Bangladesh's growth in passenger carrier has been 8% against global growth rate of 6% while growth in cargo sector was phenomenal; 13% against global growth rate of 7%. All these suggest that many aviation professionals would be required just to meet the domestic requirement in future.



## **Aviation Training in Bangladesh**

Aviation sector in Bangladesh has high prospect. In the next two decades, the need for professionals in this field will continue to rise exponentially. Despite its huge prospect, very few institutes conduct aviation related training in Bangladesh. These are: (Pandit, 2018)

- BAF Academy.
- Military Institute of Science and Technology (MIST).
- Bangladesh Airlines Training Centre (BATC).
- Civil Aviation Training Centre (CATC).
- Bangladesh Flying Academy and General Aviation Limited.
- BAF Flying Instructors School.
- Other Private Flying Schools.
- BAF Flight Safety Institute.
- BAF Officers Training School.
- Private Local Aeronautical Engineering Institutes.

**BAF Academy:** BAF Academy started functioning since 1973 to train air force officers. The training primarily focused on military training along with military aviation related training. Till date, BAF Academy remains one of the premium Human Resource Development (HRD) institute in aviation sector of Bangladesh including commercial pilot and engineers. Many of them after retirement from service continues to serve in the commercial private aviation both at home and abroad. So far a total of 1931 trainees including 34 foreigners have been trained in this academy. (Hossain, 2018).

**Aeronautical Engineering Program of MIST:** Aeronautical engineering program of MIST started its maiden voyage on 1st February 2009 with only undergraduate program. Undergraduate program is a 4 year curriculum, which has two major disciplines namely ‘Aerospace’

and 'Avionics'. The students need to successfully complete 161.5 credit hours to earn a B. Sc. in Aeronautical Engineering degree. (Bakaul, 2016). Graduate level curriculum (Masters) started from 2016 and post graduate level is scheduled to commence soon (Salam, 2018). The institute has also received approval from its Governing Body to start PhD in Aeronautical Engineering (Salam, 2018).

**Bangladesh Airline Training Center (BATC) (Pandit, 2018):** BATC was set up in 1972, as Ground Training Center (GTC) and re-named as BATC in 1988. The aim was to establish this facility as a regional training center for Aircraft Maintenance Engineering (AME). At this moment Aerospace and Avionics engineering faculties of BATC fulfill the basic and type training requirements of Biman, as well as other local and foreign airlines. It is an approved Maintenance Training Organization of CAAB and European Aviation Safety Agency (EASA) Part 147. It regularly conducts three year long course on AME (Aerospace) and AME (Avionics) course.

**Civil Aviation Training Center (CATC):** CATC was established in 1975 with the support and assistance from ICAO/ United Nations Development Program (UNDP) as official training center of CAAB. It used to primarily teach on Air Traffic Services and Communication Engineering subjects. Other training on aviation security is also recently conducted. (Kabir, 2018).

**Flight Safety Institute, BAF:** Flight safety and regulations are very sensitive and delicate avenue in aviation sector. BAF therefore was pioneer in establishing such institute in 1990. Till date, it is the only institute of its kind in the country. It has already received recognition from CAAB. A good number of foreign participants also attend this course on a regular basis. The institute already has different world class training facilities including crash laboratory. (Hossain, 2018)

**Bangladesh Flying Academy and General Aviation Limited:** Bangladesh Flying Academy and General Aviation limited was established in 1948. For last 70 years, the Academy is training and producing pilots for

the commercial aviation sector single handedly. Around 800 commercial pilots have been produced so far from this Academy. Many of them are at present serving proudly in various domestic and international airlines including Qatar Airways and Etihad Airways.

**BAF Flying Instructors' School:** Flying Instructor's School is one of the premium flying training institutes in BAF. It was established in 1976. So far it has conducted 51 courses and have made 432 "Qualified Flying Instructor" including 7 foreign officers, 3 from Bangladesh Army and 2 from Bangladesh Navy. Recently, qualified officers are awarded with "Post Graduate Diploma in Flying" under BUP on completion of six month long course. (Hossain, 2018).

**Other Private Flying Schools:** To meet the growing demand of pilot in the commercial sector, there were different private flying institutes at different times. At present, Arirang Flying School and Galaxy Flying Academy are two established and CAAB authorized flying training school in Bangladesh. They have set up world class training facilities including residential arrangement and simulator facilities (Rahman, 2018).

**Officers Training School, BAF:** Officers Training School (OTS) was established in 1980 to train ground branch officers of BAF in their respective branch. Initially it was limited to basic training to technical branch officers. In 1985, full-fledged curriculum was established for the officers of all branches. OTS is reach with different laboratory and training facilities including Air Traffic Control (ATC) simulator. The School has already trained 819 officers including 7 officers from friendly foreign country. (Hossain, 2018).

**Private Local Aeronautical Engineering Institutes:** A good number of other private institutes are also associated with imparting knowledge in the field of aeronautics. These include: United College of Aviation, Aeronautical Institute of Bangladesh, College of Aviation Technology, National Institute of Engineering and Technology and Cambrian International College of Aviation. However, none of these institutes offer full-fledged engineering

program, rather they are mainly focused on diploma level courses. Some of them are trying to start split program with some foreign universities to impart undergraduate level education. (Bakaul, 2016)

**Assessment on Existing Aviation Training Facilities:** There are very few facilities available in Bangladesh to develop skilled aviation personnel. They are providing isolated and limited training in aviation specific subjects. These facilities were primarily built for limited output including meeting the need of some of the individual organization. Very little central coordination and standardization effort was made to regulate and facilitate these institutes. It is thus felt that the institutes discussed above to be brought under the larger frame work of BAF Aviation University and provide them with strategic guidance to get the world class output. Additionally, few other new institutes may be established to conduct specific curriculum and program.

## **Expertise Required for Bangladesh Aviation Sector**

**Shortage of Pilot and AME:** The biggest problem of our aviation sector is lack of qualified personnel. Airlines has to spend huge amount for hiring pilot and AME from abroad. The demand of aircraft is increasing but availability of qualified pilots, AME, technicians and other flight and ground crews are not increasing proportionately. (Rahman, 2018)

**Lack of Aviation Safety, Security and Regulations Expert:** Most of the airlines lack in manpower with sufficient knowledge on aviation rules and regulations. Many airlines cannot fulfill the requirements demanded by regulatory authority of civil aviation. (Rahman, 2018). Qualified personnel on civil aviation rules, regulations and standards are particularly essential for an airline to run efficiently.

**Shortage of Aviation Management Staff:** At present there are no aviation management qualified personnel in any of the commercial airline in Bangladesh. Most of them are working based on their experience and

qualification on general management. Some of the organizations are even dependent on foreign specialists (Rahman, 2018). In order to produce qualified aviation management staff for the aviation sector of Bangladesh, there is a requirement to educate personnel on this specialized area.

**Shortage of Qualified Operational Manager:** Absence of qualified operational manager was observed both in commercial and state owned aviation establishments. On the contrary, there are many aviation specific operational management courses conducted globally by various aviation training institutes. In Bangladesh, this shortage of qualified operational managers are filled by aviation experienced personnel. (Rahman, 2018).

**Lack of Air Cargo Manager:** Air Cargo flights are another avenue of commercial aviation. Bangladesh commercial aviation has not yet ventured beyond domestic in this area. However, globally there is huge opportunity and the trend is on the rise. Bangladesh at present does not have much satisfactory impression on the standard of air cargo handling. It is thus felt that, the country is unable to capitalize much benefit in this area. Appropriately educated and trained personnel on air cargo management can be of great enabler in enhancing economic activities (Rahman, 2018).

**Lack of Search and Rescue Management Expert:** Search and Rescue is an integral element of any aviation venture. Nationwide responsibility of search rescue in the airspace of a nation lies with that countries civil aviation authority. However, in Bangladesh there are no formal training on this area and not to mention the management part of it. As the aviation activities continue to increase there will be requirement of Search and Rescue management experts by aviation regulating bodies and also private aviation organizations (Kabir, 2018).

**Lack of Aviation Medicine Specialist:** Aviation being a different environment, the crew and passengers are subjected to the peculiarity at various times. Often cabin crews need to provide essential medical services onboard, while the crews have to remain aware of altitude flying and other physiological effects of flying. In Bangladesh except BAF there

is no education to develop aviation medicine specialist. Each and every aviation organization is expected to have aero medicine specialist while the regulatory authority will have more than one. There is serious scarcity of expertise in this field (Kabir, 2018).

**Lack of Air Space and Traffic Manager:** At present there are only two institutes where professional training of ATC is carried out. CATC and BAF train newly recruited personnel and prepare them as ATC and assistant both at military and civil airports. Globally, there are many aviation institutes available which provide an opportunity to pursue higher studies in this field to contribute further and allows individual to take on higher responsibilities with better opportunities. (Kabir, 2018).

## **Compliance Requirement in Aviation Education**

To keep up with the growing passenger traffic, requires knowledgeable employees qualified through quality academic programs. These aviation training is to be given by training organizations, in compliance with ICAO, EASA, FAA and CAAB. The basic requirement of an Aircraft Maintenance Training Organization is found in its ANO/ (AW) Chapter C3. CAAB issues training organization's approval on the basis of ANO (AW) C3. This approval is renewed every year through quality audit system conducted by CAAB. (Pandit, 2018). Any training arrangement made to enhance and develop skill in aviation sector has to be conducted in a CAAB approved training institute. In this regard the training establishment must meet the requirements of ANO/ (AW) Chapter C3 and regulations of EASA part 147 (Kabir, 2018) (Dormoy, 2018). In Bangladesh, only BATC is EASA part-147 approved maintenance training organization for AME licensing since 2012. (Pandit, 2018).

## **Structure and Curriculum for BAF Aviation University**

**Vision and Mission of Proposed Aviation University:** Suggested vision of the University can be "To become a leading national university in the field of

aviation through excellence”. With this vision, the mission of the University can be “To transform people into Aviation professional and enthusiast by providing world class education”. Some of the main programs, faculties and ideas under academic wing are highlighted subsequently.

**Broad Academic Outline:** Proposed BAF Aviation University will be mandated to conduct various graduate and post graduate programs in aviation related subjects. Some of the key programs that may be conducted are mentioned below.

### **Bachelor’s Degree Program**

- Bachelor of Science (B. Sc) in Aviation (Flying)
- B.Sc. in Aviation (Flight Dispatch)
- Bachelor of Aviation Management
- B.Sc. in Aviation Science (Air Traffic Management-ATM)
- B.Sc. in Electrical and Electronics Engineering.
- B.Sc.in Mechanical Engineering.
- B.Sc. in Aeronautical Engineering (Aerospace).
- B.Sc. in Aeronautical Engineering (Avionics).
- B.Sc. in Aircraft Maintenance Management.
- B.Sc. in Aero Information and Communication Engineering.
- Bachelor of Aviation Medicine
- Bachelor of Airport Management

### **Master’s Program**

- Masters in Airworthiness.
- Masters in Aviation (Flying).
- Masters in Aviation Management.

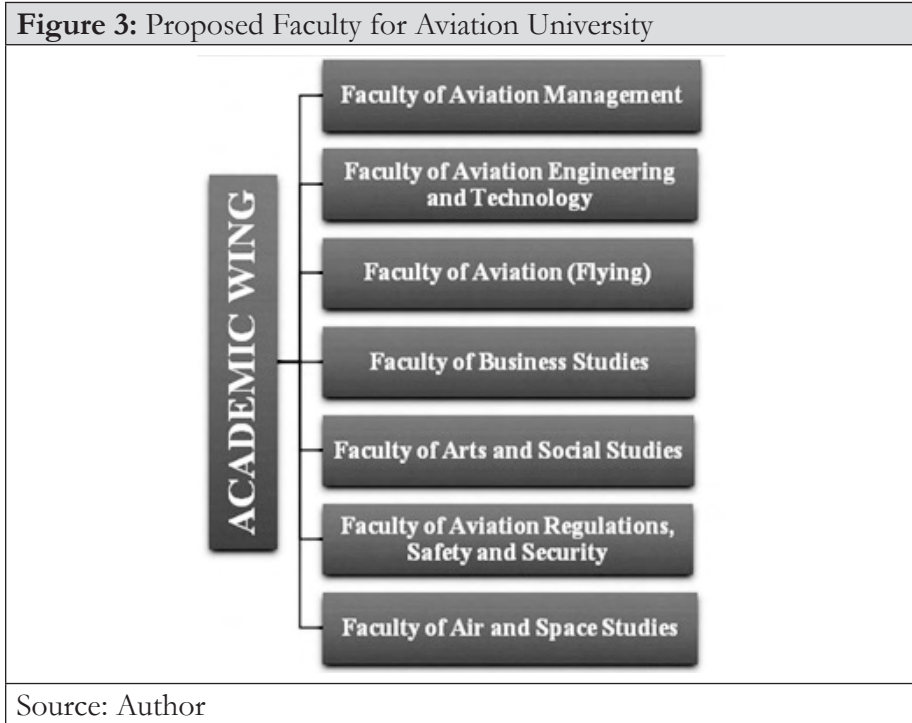
- Masters in Aircraft Maintenance Management.
- Masters in Aeronautical Engineering.
- Masters in Aeronautics & Space Science and Technology
- Masters in Safety Management System(SMS) in Aviation
- Masters in Aviation Safety.
- Masters in Aviation/Aerospace Medicine.
- Master of Science in Airport Management
- LL.M in Advanced Studies In Air and Space Law
- Masters in Aviation Law
- Masters in Safety and Accident Investigation
- Masters in Safety and Human Factors in Aviation

**Doctor of Philosophy (PhD) Degree:** Ph.D. in Aviation degree will be designed to educate students and professionals in conducting essential research in all areas of this important field of study, extending the aviation body of knowledge from national prospective.

**Proposed Faculties:** In the proposed model of Aviation University for Bangladesh, each faculty will help coordinate and lead current and new efforts to improve the learning experience of students, and help position the University for National Leadership in Aviation and Aerospace. Academic, discipline-based faculties are the primary units for carrying out the University's mission. Based on the research and sharing valuable experience from various senior officers of BAF and Aviation Industry, studying the suggestions from different aviation organizations, different faculties and departments for Aviation University is proposed. (Haque, 2018). Name of different faculties are placed below as Figure 3 for ease of reference.



**Figure 3:** Proposed Faculty for Aviation University



Source: Author

**Proposed Institutes:** Academic institutions are the true source of guaranteeing growth in a sustained manner. Such institutions are able to take state aspirations towards higher heights of professional excellence through proper care and attention. Listed below are some of the institutes that are primarily identified to serve the interests of different faculty by producing highest quality scholarly work and quality curriculum.

- Institute/Centre of Air and Space Studies (New)
- Institute of Aviation Management (New)
- Institute of Aviation Maintenance (New)
- Institute of Aviation safety and Regulations (renaming FSI, BAF)
- Institute of Aviation (Flying) (renaming Bangladesh Flying Academy)

**Affiliated Institutes:** Proposed University model intends to bring concerned geographically dispersed aviation institutes under one umbrella.

Existing institutes of BAF, Biman, and Civil Aviation will be used to form foundation of proposed Aviation University.

- BAF Academy.
- Bangladesh Flying Academy.
- Biman Airline Training Center (BATC).
- Civil Aviation Training Center (CATC).
- Command and Staff Training Institute (CSTI), BAF.
- Flight Safety Institute (FSI), BAF.
- Training Wing, BAF.
- Officers' Training School (OTS), BAF.
- ATC School, BAF.
- Aero Medical Institute (AMI), BAF.
- Private Flying Clubs.
- Private Aviation Universities/Colleges

## **Recommendations**

Based on the research work conducted, following recommendations may be implemented to develop appropriate Human Resource in aviation sector of Bangladesh:

- GOB to finalize and publish “BAF Aviation University Act 2018” at the earliest.
- UGC to allot necessary budget and assistance to establish BAF Aviation University.
- BAF to designate important appointment holders and committees at the earliest to establish various facilities for BAF Aviation University and develop course contents.

- Develop different curriculum and course contents in compliance to EASA 147 and CAR 84 regulations.
- The University should establish seven faculty along with their departments.
- The University is to affiliate all listed training institutes and facilities mentioned earlier.

## **Conclusion**

Aviation sector is identified as the future thrust sector. Dhaka is expected to be one of the 90 megacities of the world in the aviation terms. The rise in passenger and cargo movement by 2030 is expected to be double. The trend of growth is more phenomenal in South Asia and specifically in Bangladesh. Particularly in Asia, aviation industry is booming. The growth in this sector relates to increase in job opportunities. Due to lack of appropriate farsightedness and concerted effort Bangladesh has not so far developed skilled manpower in aviation sector. There lies acute shortage of skilled manpower in aviation sector of Bangladesh.

Propelled by the rising economy, Geo-strategic location, favorable demographics, substantial progress in aerospace industry, rising domestic and international market are showing a bright future. So far the country could not capitalize in aviation sector due to lack of skilled manpower. At present there is not a single academic institute to support highly demanding aviation industry.

Meanwhile, Bangladesh is going through demographic dividend phase. GOB has duly felt the necessity to invest in education sector in order to develop human resource for better economic growth. This happy synchronization between job opportunity and available work force can better be tapped through appropriate skill development. GOB has planned to establish Aviation University under the supervision of BAF and it is thus essential to identify which all are the focus areas that should be incorporated in this specialized University.

This paper has identified number of existing training facilities of BAF, Biman, CAAB and private organizations which can be affiliated for the conduct of various graduate and post graduate programs in aviation sector. There are also requirements to establish few new Institutes.

The research has also identified that compliance to the needs of aviation regulatory authorities like CAAB, EASA and FAA is very essential to international recognition of different courses. Bangladesh Aviation University will have to comply with the requirements of these regulations.

Bangladesh needs to grab the opportunity that is evident in the aviation sector at the earliest. Establishment of Bangladesh Aviation University under direct supervision of BAF is the right approach. BAF needs to take the lead and prepare all essential elements. At this stage, the objective of BAF may be to commence first Academic session from January 2020.

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# **CHALLENGES OF CONVERTING POPULATION INTO RESOURCES: AN EXPLORATORY STUDY IN SADAR UPAZILA OF RANGPUR DISTRICT**

**Joint Secretary Md Abdul Majid, ndc**

## **Introduction**

Bangladesh has got population size more than expectation and beyond the absorption capacity. But with this situation Bangladesh is not so poor but very rich in poor people and human being. Human Being (HB) versus Human Resource (HR) is a popular debate throughout the world. Bangladesh is not an exception here. Now a days, business and profit mechanism and trends dominate on every single issue. That's why it triggers the worldwide idea debate that human being is an asset or a liability. Population or human being naturally remains as a liability if it is not properly transformed into asset. The present system and technique of developing human being into human resource are not progressively structured and well planned. There is a huge gap between these two. Human naturally tends to remain as human till it is not qualitatively educated and properly trained for HR. This nation has been suffering hugely for lack of skill human resources against a huge bulk of idle population or human beings. Bangladesh is bearing the burden of increasing liabilities of almost 165.73 million (Worldometers) people which could provide multiple returns if transformed into esteemed human resources by appropriate and quality education and training. Therefore Human Resource Development (HRD) and its quality management remain the core issue for the national development. This conversion of population into human resource is certainly a huge challenge but not at all impossible. If the country succeeds in developing human resource in true spirit and right dimension, it will surely boost up the status to Middle Income Country (MIC) from Lower Middle Income Country (LMIC).



In this pace of development and having brilliant opportunity of demographic dividend in the recent population transition, HRD is a major issue in Bangladesh and also a priority concern for sustainable development.

Finally, it is interesting to observe that although Bangladesh seems to allocate a negligible amount on R&D in the early budgets, the country still manages to enjoy some contributions from R&D in her economic growth. One of the reasons of minimum budget allocation could be the lack of recognition of the role of research in innovation where, normally, the operations/production personnel play major role while choosing technology, training, operations, etc., and the role of research comes much later. In order to catch up the fast growing economies like the BRIC-economies and ensure smooth economic convergence as one of the next-11 market economies of the world, the government of Bangladesh needs to recognize the significance of the facilitation of industry-specific R&D activities, promote university-industry (U-I) linkages and partnerships as well as support the continuous development and grooming of R&D-personnel and prioritize them over operations/production staff in technology-related operations and decision makings.

## **Policies and Practices on HRD in Bangladesh**

### **Education Policy 2010 and HRD in Bangladesh**

Over the decades of repeated failures in formulating and implementing education policy, the present government undertook the initiative to formulate an Education Policy in line with the need of the modern times, with a view to building the future generation as a skilled human resource, efficient in knowledge and modern technology and inspired with moral values, national culture, tradition and the spirit of liberation war. The Education Policy 2010 of Bangladesh duly reflects the aspirations and expectations of the nation and creates importance mainly on science, technical education and religion (GOB 2010).

## Prospect Analysis of Human Resources Development Initiatives in National Level

The table-1 mentioned below speaks out that if we look into the future prospects we can see there is a growth trend in government initiative through ADP allocation in national budget. Budgetary allocation in this sector has been increased every year from FY11-12, where total allocation doubled to BDT 22492 crore from BDT 12810 crore. It is gradually increasing (Islam 2015).

<b>Table 1: Human Resources Development Initiatives in National budgets</b>					
Human Resources Development Sector (in National Budget)	FY: 11-12	FY: 12-13	FY: 13-14	FY: 14-15	FY: 15-16
Educations	5657	6936	8378	9425	9739
Science and Technology	215	366	693	3185	2374
Health	3562	3825	3602	4349	5331
Youth, Sports and Culture	688	518	560	705	834
Labour and Manpower	176	332	370	413	466
Social Security, Welfare (women & child)	2512	2513	3174	3710	3748
Total Allocation in ADP (Fig in crore)	12810	14490	16777	21787	22492
Source: Allocation of ADP expenditures by MoF, GoB					

The analysis depicts that, in the year 2013 Bangladesh reach to medium level from low level; the point competitive to India. In four years trend Pakistan degraded the position and there no change in India and Nepal. The data exhibits a positive prospect towards Bangladesh in future days, if all variable got right focus and action-oriented emphasis (Islam 2015).

## TVET Institution by Locality and Year

The total number of TVET Institution in the country was 1251 before the independence of the country, which increased to 2800 in 1999 with 1549 new Institution during 1971-1999; it again increased to 7555 in 2008 with 4755 new Institution during the period 2000-2008; and finally it became 13631 Institution in 2015 with 5608 new Institution i.e., 42.6% increase during the period 2009-2015. The increase rate is satisfactory to some extent (BBS 2015).

## Seat Capacity and Students by Type of Course (Number in '000)

<b>Table 2: Course wise seat capacity, admission and passing number</b>				
Type of Course	Seat capacity	Admission	Examinee	Passed
Diploma Programme	172	154	143	131
HSC Vocational / Business Management	184	143	129	115
SSC Vocational	208	167	139	136
Basic Course/Short Training	517	1301	1348	1331
Bangladesh total	1082	1764	1759	1713
Source-TVET Census 2015 by BBS				

The above table-2 shows that total seat capacity in the country is 1082000. But number of admission, examinee and passed is more than the seat number. So seat number needs to be increased reasonably (BBS 2015).

## Labour Force and Employment Situation in Bangladesh

### Employed persons by status and type in TVETs

<b>Table 3:</b> Employment category of regular and part time of both sexes in number (up to September 2015)					
Category of Employment	Total Employed	Regular Male	Regular Female	Disables	Part-timers
Teachers/trainers	74043	57032	17011	323	9327
Staffs	54033	44665	9368	158	3347
Others	2328	1417	911	21	569
Total	130404	103114	27290	502	13243
Source-TVET Census 2015 by BBS					

The above mentioned table-3 shows that employment in all categories in the institution is 130404, out of which 13243 is part-time. It is significant. It needs to be reduced. Female employment as showed in table is many fold less than the male. It is something notable to be addressed. It is significantly noticeable that total disable employment in the TVET institution is 502 (BBS 2015).

### Employed Population in Bangladesh (in millions)

The employment size of Bangladesh is increasing over time. But the number of employed women increased more than doubled by 13 years. It was 7.90 million in 1999-2000 and reached to 16.80 million in 2013. The number of employed men was 31.10 million in 1999-2000 and reached to 41.20 million in 2013. But it is not sufficient because per year increasing is less than 2 million, coming out newly per year for job. On the other hand employed women population is too much less than men employed. So it demands more employment opportunities for women in the country (BBS 2013).

## Category Wise Overseas Employment by Bangladesh

The Category Wise Overseas Employment Bangladesh labour force from 1976 to 2017 says that the Less-skilled labour is highest 5520493 (48.15%) followed by skilled labour 3833406 (33.44%). Third position is Semi-skilled labour 1744469 (15.22%). Professional 232391 (2.03%). Others 134177 (1.17%). So Less-skilled labour needs to be addressed vigorously for promoting to semi-skilled or skilled (BMET 2017).

### Data Analysis

Analyzes the primary data and statistics derived from the field offices of related department and institutions of survey area of Rangpur sadar upazila and City Corporation. This chapter also analyzes the information and opinions derived from 52 respondent of the survey area. Here it is notable that all the 52 respondents have completed technical/vocation training from either Technical School and College or Polytechnic Institution or Technical Training Centre or Department of Youth Development or Department of Women Affairs. Correlations and comparisons among the variables have been determined and analyzed here properly and manually.

### Sex Percentage of Respondents

The Sex percentage analysis of the respondents says that the total number of respondents is 52 out of which male is 27 (52%) and female is 25 while the total population is approximately 5467.

### Skill Level Achieved by the Respondents

<b>Table 4: Skill level achieved from the technical/vocational education/training</b>					
Skill Level	Male	%	Female	%	Total %
Skilled	08	29.63%	11	44.00%	36.54%
Semi-skilled	19	70.37%	10	40.00%	55.77%
Less-skilled	0	0%	04	16.00%	7.67%
Total	27	100%	25	100%	100%

The table-4 speaks out the skill level achieved by the respondents from the technical/vocational education/training. It shows that among the male respondents the highest number of respondents that is 70.37% are semi-skilled (as they feel), while 29.63% have become skilled. None is less-skilled. On the other hand, among the female respondents highest number that is 44% are skilled followed by 40% of semi-skilled. It is noticeable that 16% is less-skilled among the female respondents. It indicates that female has become more skilled than male. Among the total respondents, highest 55.77% are semi-skilled followed by 36.54% skilled.

### Causes of Not Getting Skilled

The data says that there are so many causes of not getting skilled in technical/vocational education/ training. The highest 38.60% of total respondents say that insufficient equipment is a cause of not getting skilled in technical/vocational education/ training, while 26.32% say about the cause of lack of practical sessions and 17.54% of respondents say lack of attentiveness of students/ participants is the cause of not getting skilled. Due to lack of holding required number of classes is the cause of not getting skilled as mentioned 12.28% respondents.

### Employment Situation of the Respondents

<b>Table 5:</b> Employment situation of the respondents in both sexes					
Employment situation	Male	%	Female	%	Total %
Employed by others	07	25.93%	05	20.0%	23.07%
Employed by self	11	40.74%	08	32.0%	36.55%
Unemployed	09	33.33%	12	48.0%	40.38%
Total	27	100%	25	100%	100%

Table-5 shown above illustrates the employment situation of the respondents having completed technical/vocational education/training.

The data flashed on the table shows that out of 27 male 25.93% are employed by others, 40.74% are employed by self and 33.33% are still unemployed. On the other hand out of 25 female 23% are employed by others, 36.55% are employed by self and rest 40% are stilled unemployed. In aggregate percentage we see 40.38% are still jobless. This is not satisfactory scenario. It indicates so many dimensions which are mentioned later on. Those are lack of skill, shortage of vacancies, corruption and other difficulties in recruiting process etc. so all dimensions mentioned here need to be addressed.

### **Cause of Not Getting Job (Employed by others)**

<b>Table 6:</b> Cause of respondent's not getting Job (Employed by others) in both sexes					
Causes	Male	%	Female	%	Total %
Lack of vacancy	11	40.74%	07	30.43%	36%
Corruption	06	22.22%	03	13.04%	18%
Lack of efficiency	03	11.11%	07	30.44	20%
Others	07	25.93%	06	26.09%	26%
Total	27	100%	23	100%	100%

The table-6 shown above describes the causes of not getting jobs (employed by others). From the table50 we see that only 23% are employed by others. Here this table shows the causes of not getting jobs. Data flashed on the table expresses that 36% respondents say lack of vacancy is the cause of not getting jobs while 18% say it is corruption. 20% respondents say lack of efficiency is a cause of not getting job while the rest 26% say about other causes. More female respondents (30.44%) than the male respondents (11%) highlight the lack of efficiency as a cause.

## Causes of Not Having Self-employment

<b>Table 7: Causing of not having self-employment of some respondents in both sexes</b>					
Causes	Male	%	Female	%	Total %
Lack of confidence	03	30%	05	29.41%	29.63%
Lack of capital	06	60%	09	52.94%	55.56%
Lack of market facilities/demand	01	10%	03	17.65%	14.81%
Non-profitable	00	0%	00	0%	0%
Total	10 (option not given by all)	100%	17 (option not given by all)	100%	100%

Table-7 shown above described the causes of having self-employment. The table-data shows that highest percent of male (60%), female (53%) and the highest aggregate respondents (55.56%) highlight the lack of capital as the cause of not having self-employment, while 29.63% respondents say about lack of confidence. Around 15% of the respondents mention lack of market facilities/demand as the cause of not having self-employment. Number 3 and 4 causes are serious in nature to some extent. It needs to be addressed by the government.



## Respondent's Suggestions for Further Improvement

<b>Table 8:</b> Respondent's suggestions for further improvement of the prevailing technical/ vocational education/training system					
Suggestions	Male	%	Female	%	Total %
Create more scope for technical/ vocational education/training	18	21.95%	11	18.03%	20.28%
Expand up to upazila level	11	13.41%	09	14.75%	13.99%
Enhance capacity of the institution/office	05	6.10%	03	4.92%	5.59%
Create good match of training trades with demands	08	9.77%	04	6.56%	8.39%
Ensuring sufficient budget	06	7.32%	06	9.84%	8.39%
More employment generation in public and private sectors	11	13.41%	08	13.11%	13.29%
Ensure equality in employment	04	4.88%	06	9.84%	6.99%
Availability of capital for self employment	12	14.62%	09	14.75%	14.69%
Create/develop market facility in public/ private management	07	8.54%	05	8.20%	8.39%
Total	82 (more option given)	100%	61 (more option given)	100%	100%

The table-8 mentioned above illustrates the valuable suggestions given by the respondents for further improvement of the prevailing technical/vocational education/training system. Nine types of suggestions they have given. Highest percentage of respondents (20.28%) have suggested for creating more scope for technical/vocational education/training throughout the country. Around 15% respondents make suggestions for ensuring availability of capital for self employment, while 14% respondents give opinion for expanding all type of technical education/training up to upazila level. Around 6% and 8% of respondents opine respectively to enhance capacity of the institution/office and to create good match of training-trades with demands of the market. Again at least 8% of the respondents suggest for ensuring sufficient budget for the institutions.

## **Challenges and Problems**

TVET in our country is so far facing multi-faceted and multifarious challenges and problems that firstly need to be prioritized and then to be removed for moving forward to a sustainable human resource development process. To some extent low internal and external efficiency of TVET as a whole in providing market driven and relevant course program partially hinders the production of skilled manpower in the country. Now from the analysis, observation and findings done above, the researcher has come to identify the following specific challenges:

- Lack of comprehensive and need-based survey to assess the sector-wise training requirement.
- Access to the formal TVET is very much limited which debar a vast population to enter into it.
- Female students are facing limited access to TVET system due to social stigma and lack of gender friendly environment in TVET institutions.
- TVET providing institutions in the country are far behind the international standards and quality guarantee.

- Lack of proper connection with international labour market/ organization.
- Lack of governance congenial administration of TVET institutions.
- Poor monitoring and performance evaluation of TVET.
- Lack of PPP framework in TVET system. Recently BSEP project has introduced a few PPP programs on pilot basis which needs to be encouraged.
- Lack of employment generation and job opportunities for the TVET graduates.
- Lack of lab and workshop and equipment and physical facilities in TVET institutions.
- Lack of teachers, trainers and support staff in the TVET institutions.
- Lack of sufficient teacher training facility to face the challenges of the TVET system.
- Financial crisis of the TVET institutions in terms of training allowance, contingency fund, equipment fund etc.
- Lack of good coordination among the TVET institutions of multifarious ownership.
- Lack of capital for the youths to be self employed/entrepreneur.
- A significant portion of trained youths are suffering from lack of confidence and social support for being entrepreneur.

## **Recommendations**

The national labour force increases annually by roughly 2 million people most of whom are youth. More trained and skilled workforce need to be produced to contribute to the national economic development through

improved productivity and more employment generation in the local employment market and abroad needs to be done on the basis of priority. Now from the analysis, observation and findings done above and the set of challenges identified above, the researcher has come to set now some realistic and implementable recommendations for the better remedies of the problems and challenges in converting population into human resource:

- A conclusive TVET strategies should be formulated by concerned department and ministry on the basis of the provision made in the 'National Skill Development Policy'.
- Quality Assurance of the TVET should be maintained in all level and all institutions in a planned way through continuous high level monitoring and assessment by concerned department and ministry.
- Continuous appropriate research and study should be conducted to design proper TVET system including improved and modern course curriculum and trade having created a good match with local and overseas market demands by BBS and BMET.
- Ensuring by concerned departments and ministries timely procurement of up-to-date and modern equipments, tools and apparatus for the advancement of applied knowledge.
- Governments should encourage enterprises and industrial organizations in the country to ensure participation in TVET system through providing significant incentives, subsidizing apprenticeship wages and assisting the stipend program for the students.
- Ensuring more arrangement of effective counseling and guidance to the youths of the society for vocational training and as well as setting minds of parents, stakeholders and community in favour of vocational education and training by concerned departments and ministries.
- Systematic and institutional arrangement for professional development of TVET Trainers and Assessors round the year.

- Concerted actions for promoting TVET program for women. Introduction of stipends and other financial benefits may be made to encourage girls' participation. Gender friendly environment is also an utmost requirement.
- Ensuring by the government a good coordination among the industrial sectors and TVET institutions, as well as coordination of intra TVET institutions of multifarious ownership to have good end result.
- Enrich lab and workshop with modern equipments and tools and enhance lab and workshop facilities for all the students.
- Make available of low-interest bank loans for the graduates who needs.
- Establish new TVET institutions up to upazila level on the basis of requirement.
- Establishing institution-based high team for monitoring education and training quality in TVET institutions and assessing job settlement situation.
- Significant step from public and private sector to control the population size farther reducing population growth rate and TFR.

## **Conclusion**

Human Resource Development (HRD) is a popular and burning question across the world due to its tremendous contribution in all sectors and fields of development of a nation. Sense of potentiality and benefit dimension push forward such an idea that human being (HB) has to be an asset and can never remain as a liability for the society. Skill and productivity of HR are the two big components and variable for any sort of professional production. Here productivity is a dependable variable. It depends on the increase of skill. Bangladesh has the highest densities of population with over size. So she has got ample opportunity to get enormous benefit from this population as contemporary world has developed remarkably through the maximum utilization of human resource.

The constitutional distinct provision of Bangladesh has got sufficient proper guidance and necessary directives to develop the HRD in the country uniformly and equally in rural and urban areas of the country. In that case the education system of the land must appear to be the vital tools for Human Resource Development in the country with a harmonious pace. Since independence of Bangladesh till date a lot of commissions and committees on education system were formed to develop the HR. But no significant result was found. At last in the year 2010 a comprehensive education policy was formulated. This policy has ensured necessary guidelines provisions for expansion of universal education, technical and vocational education and totally removal of illiteracy from the country.

Bangladesh observed an increased need and thirst for technological and as well as industrial skills in the last few decades, while alongside the country experienced a rapid expansion in Technical and Vocational Education and Training (TVET) providers, both in the public and private sectors. But it is remarkably noticed that a substantial gap exists between the industry skills requirements and the supply of trained and competent human resource i.e. human capital. The complete scenario of the country's TVET system is a must for creating a pool of highly skilled, productive, and deserving technical and vocational human resources. The major role of the TVET provider is to provide technical and vocational training opportunities and facilities and career developing avenues for the potential youths leaving the academic main stream of education.

Public TVET training in Bangladesh is being delivered by the institutions belonging to 22 ministries of the government. Side by side a large number of private institutions throughout the deliver training courses mainly commercially. Besides these, hundreds of large and small NGOs are offering skill training through short courses. Industry bodies also provide training as per the needs of relevant enterprises through on-the-job (OJT) training. A very few recruiting agencies in the country for the overseas employment market are operating training institutes to cater for the needs of the Foreign Employers.

In Bangladesh there is no ministry exclusively dedicated for the HRD. But Bangladesh has a high power organization namely National Skills Development Council (NSDC). It is the apex approval authority on TVET matters headed by Prime Minister. NSDC Secretariat has been formed to facilitate the Technical and Vocational education and Training (TVET) reform project. Both the NSDC and the Executive Committee for National Skills Development Council (ECNSDC) are non-establishment bodies consisting of part-time members from Ministries and must be supported and advised by a Secretariat. In many developed and developing countries of the world namely Bhutan, Germany, India, Japan, Malaysia, Pakistan, South Africa, USA have exclusive central ministries or organization for HRD. Education strategy and Employment strategy have to be synergized for both male and female with equal emphasis. An overhauling review is a keen need to remove the mismatch persists in overseas employment forecast and preparation and demand. A serious rethinking on lack of central planning of HRD is needed to reduce skill shortage so as to reach skill surplus nation.

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## **Author**

Joint Secretary Md Abdul Majid was born in 1965 in a respectable Muslim family. He was graduated from the University of Rajshahi and obtained his Masters in Social Science (Political Science) from the same University. He joined Bangladesh civil service on 26 January 1991. As a member of Bangladesh Civil Service (Administration) cadre, he served in various administrative positions in field administration. He worked as Assistant Commissioner, Senior Assistant Commissioner and Magistrate in different Districts. He was Upzilla Nirbahi Officer and Additional Deputy Commissioner in three Upzillas (Sub-district) and one districts respectively. Besides, he served as Deputy Commissioner in a District for two years having nationally awarded as best DC in ICT activities. Prior to joining NDC, he worked as Additional Divisional Commissioner (Joint Secretary) in one Division. Moreover, he served the Ministry of Post of Telecommunication as Assistant Secretary, Ministry of Primary and Mass Education, Ministry of LGRD as Deputy Secretary. During his service life, he underwent a number of courses at home and abroad. He visited some countries across the globe. His hobby is travelling.

# **INDIA'S RELATIONS WITH AN INCREASINGLY ASSERTIVE JAPAN AND LIKELY IMPLICATIONS ON INDIA'S SECURITY POLICIES**

**Air Commodore Inderpal Singh Walia, AVSM, VM, ndc**

## **Introduction**

Japan and India have traditionally enjoyed steady good relations, singularly bereft of any of the usual complications. India is consciously seen to be widening its areas of interest, announcing an 'Act East' Policy in the Indian Ocean Region. In the recent past under PM Shinzo Abe, Japan has started to reform its national security policies, modifying the constricting Article 9, increasing defense spending, after long years of cuts, displaying assertiveness, confronting China in its policies and actions and has actively seeking out new partnerships. However, the impact and consequences of the effect of Japan's growing assertiveness on the relationship with India have not been explored. In this context, the expanding nature of the India-Japan relationship is bound to have an effect on India's existing relationships with other countries and India will have to re-evaluate and re-calibrate its foreign and security policies.

The broad objective of this study is to study the nature of the India-Japan Relationship in the context of increasing assertiveness of Japan and specifically to examine, as to how this relationship shapes India's security policies and the nature of its engagement with Japan. It will seek answers to the questions; What advantages and disadvantages accrue to India, in its engagement with an increasingly assertive Japan? How does the nature of this relationship shape India's strategic engagements with Japan and other significant regional players? What is the impact of this relationship on India's Security Policies?

It is proposed to study the problem through the template of the Theory of Defensive Neorealism in International Relations (Waltz, 1979), which derives its essence from Realism's five base theoretical assumptions.

## **Understanding Japanese Security Concerns**

India began to be accorded space in Japan's foreign-policy calculations gradually in 2000, as evidenced in Aso's essay on 'Arc of Freedom and Prosperity' (Aso, 2006). The address of PM Abe to the Indian Parliament titled, "Confluence of Two Seas" (Abe, 2007), was particularly significant. In 2012, Abe authored an article, "Asia's Democratic Security Diamond", where he argued that, "Japan's top foreign policy must be to expand the country's strategic horizon" and envisaged that Australia, India, Japan and the US State of Hawaii, form a strategic diamond to safeguard the Indo-Pacific Region. He also wrote that, "...of the two countries (other than the US), India...deserves greater emphasis" (Abe, 2012). During PM Abe's visit to India in December 2015, the 'India-Japan Vision 2025' was launched. Its 44 paragraphs set out a game-plan to achieve the objectives by 2025. (Modi, 2015). India's perspective was articulated by PM Modi, "strong India-strong Japan will not only enrich our two nations. It will also be a stabilising factor in Asia and the world" (Modi, 2016).

**Defence Engagement:** India's relationship with Japan in the defence and security field has been comparatively subdued, primarily due to the constraints placed by the Japanese constitution and their complete dependence on the US for their security needs. In 2008, PMs Manmohan Singh and Aso signed the "Joint Declaration on Security Co-operation between Japan and India" (Declaration, 2008) formalising defence and security related relations.

Japan faces many security challenges today, especially from an assertive China, compounded by the changing nature of its US Alliance. The history of the region, is also a violent struggle between the states of China, Korea, Japan and Russia, with Japan having superiority from 1890 to 1940s. Memories of harsh atrocities, subjugation, humiliation of defeats, clash

of racial and cultural superiorities and cumulative historical enmity, form the background which shapes the geo-political environment in the region today.

**Japan's Territorial Disputes:** Japan, China and Taiwan dispute the ownership of a group of uninhabited islands, called Senkaku. Japan has a territorial dispute with South Korea over a small group of islets in the Sea of Japan called Dokdo. Japan and Russia dispute the possession of four islands of the Kuril Islands chain from the Kamchatka peninsula towards Japan, lying in the Sea of Okhotsk. These islands were annexed by the Soviet Union, at the end of WW II.

**Japan-China Relations:** Japan-China relations come with a lot of historical baggage. The main issues affecting the relationship are :

- The Japan-US Alliance and presence of US forces in Japan, are perceived as threat to China.
- Senkaku/Diaoyu Islands dispute.
- Memories of Nanking Massacre, colonization of Manchuria and insufficient remorse.
- Public visits by senior Japanese leaders to Yasukuni Jinja.
- Economic competition.
- Disputes over islands and reefs in the SCS and perceived Japanese meddling.
- Chinese access to the Western Pacific and irritation over Japanese and US control over the area.
- Changes in Japan's Defence Policies.
- Japan's recent assertiveness, seen as influenced by and serving US interests.

- Difference in perception of Victor and Loser in WWII. The US and its allies (which included China), defeated Japan in WWII. Japan had battled the US in a brutal Pacific campaign and strongly believes, that they fought and lost to the US Forces only. The Chinese being a part of the US Alliance, believe that they defeated the Japanese too and hence they are the victors. This perception is not shared by the Japanese, who do not psychologically accept that the Chinese had any part to play in their defeat.
- Japan's growing relations with Australia and India.
- Indian and Japanese aspirations for permanent membership of the UNSC.

**Japan-North Korea Relations:** Japan–North Korea do not have formal relations and present ties are severely strained, tense and hostile. US Forces in substantial number are stationed permanently in Japan, and in addition to the home country forces, present a very high level of threat in the North Korean perspective (OPLAN5027, 2017). In the event of any conflict with North Korea, it is evident that forces from Japan would be certainly involved, making Japan a legitimate target for the North Koreans (Johnson, 2017). The US presence in Japan is thus, both a boon and source of high concern for Japan.

**Chinese Activities in the South-China Sea:** The sea lanes from the Middle-East through Malacca Strait and the South-China and East-China Seas are strategically important for Japan, which depends on maritime trade for more than 99% of its total trade volume (MLIT, 2007). Until now, Japan has relied mainly on the US for the defence of these sea lanes. In recent years, however, the US expects higher involvement from its allies and partners in these spheres, and Japan will have to shoulder this burden to some extent.

**Senkaku:** The contest over the Senkaku islands has heated up in the last seven years. The location is strategically important, controlling Chinese access to the Western Pacific. In September 2012, Japan nationalised

these islands (Ryall, 2012) sparking off a series of aggressive actions by the Chinese and the Japanese coast guards. On 23rd November 2013, China set up the “East China Sea Air Defense Identification Zone” which included the Senkaku Islands, and announced that it would require all aircraft entering the zone, to file a flight plan (China Embassy in USA, 2013). The ADIZ overlaps with the Japanese ADIZ, (Fig 10) bringing both sides into direct conflict in the Senkaku Isles region (MOFA, 2013).

## Evolution of Japan's Security Policies

The changed security scenario in NE Asia, growing assertiveness of China and Japan's own vision for itself, has generated huge debate amongst the Japanese. Japan believes itself to be shackled by the limitations imposed by its Constitution and feels that other nations consider it weak and take advantage. In September 2015, a marked shift was made in Japan's security policies after marathon public and parliamentary debates (Japan MOD, 2016). The Diet passed a Legislation for Peace and Security (MOFA Japan, 2016) which consisted of two laws: “Act for Development of Legislation for Peace and Security”, (Japan MOD, 2016) which partially amends the Self-Defense Forces Act (Japan MOD, 2016), ten other laws so that Japan can participate as a normal military power along with the international community, and the International Peace Support Act (MOD Japan, 2016), which allows cooperation and support activities for the armed forces of foreign countries, in collective activities. At a fundamental level, it permits the JSDF to use force, to come to the aid of an ally or partner in threatening situations, which was earlier prohibited under the interpretation of the Constitution.

**Defence Budget and Acquisitions:** The defence budget has shown an increase since 2012. The budget of 2018 (MOD Japan, 2017) includes supporting stability in the Asia-Pacific region, and also improving the global security environment. The budget for FY2018 rose to ¥5.19 trillion and covers upgrades to the BMD system and procurement of long-range cruise missiles (500km range) (Enjoji, 2017). Japan also plans to deploy

two Aegis-Ashore anti-ballistic missile systems by 2023 (MOD Japan, 2017). Japan has also begun to fortify its remote islands by positioning units, intensifying ISR and building maritime and air superiority.

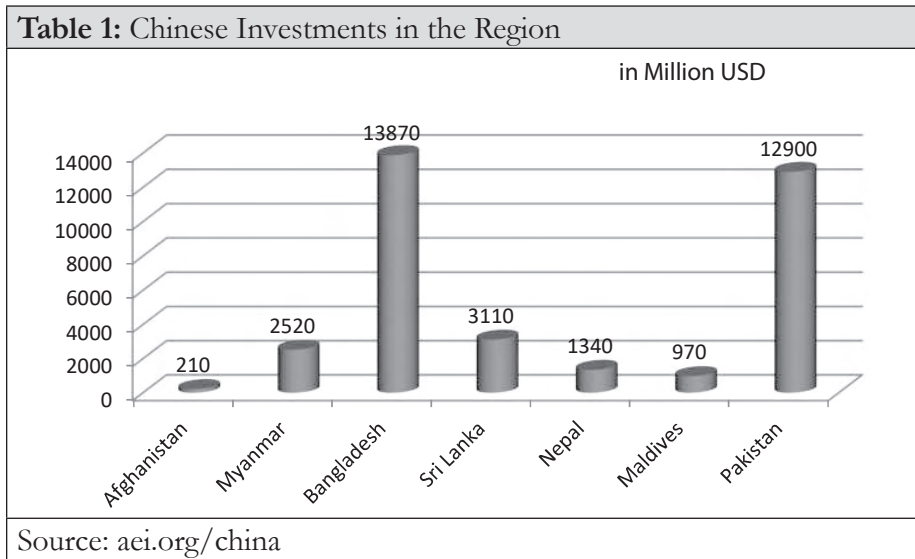
**JSDF Outreach:** The JMSDF has begun deploying ships in the IOR at much higher frequency than earlier, developing reach. Ex-Malabar 2017, off the Indian coast, featured USS Nimitz, INS Vikramaditya (both aircraft Carriers) and deployment of JS Izumo the largest ship of the JMSDF (Steve George, 2017). Japan has also transferred five TC-90 aircraft to the Philippines for training. (Rahmat, 2018). Significantly, on 3rd October 2018, a contingent of Japanese troops and JGSDF armoured vehicles engaged in exercises with the US and the Philippines in Ex Kamandag-2 in Subic Bay. This was the first time that Japan has deployed armoured vehicles on foreign soil after WW2 (Woody, 2018).

## **Drivers that Shape Indian Security Policy**

India shares its land borders with seven countries, and has major border disputes with Pakistan and China (MEA, 2017). India's interests lie from the straits of Hormuz and Aden, the littoral states of Arabia, East Africa, through the Straits of Malacca, the countries of South East Asia, China and all the way upto Japan and Vladivostok. Pakistan remains its most hostile neighbour while Bhutan is its most benign. China is its largest and most powerful neighbour, with whom there are boundary disputes in a number of areas. Today, both countries are fast growing economies with large populations and compete in the Indo-Pacific region, jostling for influence and control. The relationships between these countries, their relationships with other major players, the strategic importance of the region, interests and activities of external powers, rivalries between nuclear capable countries, all make the security environment exceedingly complex, needing careful handling.

**Pakistan:** India has boundary issues with Pakistan and they are likely to remain. Relations are at a hostile low over issues of sponsored terrorism. India views with concern, the close China-Pakistan relationship, the huge Chinese investment in CPEC, and more ominously, the building of three nuclear reactors at Chashma in Pakistan (Reuters, 2017). The development of Gwadar Port, has the PLAN regularly operating ships on deployment in the area (Kanwal, 2018). Despite cautionary statements from PM Imran Khan, there is unlikely to be any change in outlook and Pakistan will continue to increase its dependence on China for military hardware, nuclear technology, loans and infrastructure (Jorgic, 2018).

**China:** In recent years, India's relationship with China has deteriorated on account of border disputes along the LAC. China started stapling Chinese visas in the passports of residents of Arunachal Pradesh, instead of stamping them. (PII, 2011). Eight countries including Maldives, in India's neighbourhood, and Djibouti, which hosts the lone Chinese military base overseas, are particularly at risk of debt distress associated with BRI (CGDev, 2018). The port of Hambantota in Sri Lanka is an example of this strategy. A similar story is unfolding in Maldives, Pakistan, Myanmar and Nepal. Bangladesh too runs the risk of falling into the Chinese debt trap.





**String of Pearls:** China has built a network of military and commercial facilities and relationships, along its sea lines of communication, which extend from the Chinese mainland to Sudan, referred to as “String of Pearls” (Booz Allen 2005). In its first ever Defence White Paper in 2015, China has stated, that its global influence hinges on naval supremacy, which demanded that its navy moves from “offshore waters defence” to “open seas protection” (MNDPRC, 2015). India has tried to develop the strategically important Chabahar port, to balance Gwadar, with investment of \$15 billion to help build railways, roads and fertiliser plants (Gupta, 2016). In another strategic deal, Indonesia has agreed to give India access to the strategic island port of Sabang (Chaudhuri, 2018).

**Dalai Lama:** China sees the Dalai Lama as an instigator of Tibetan separatism and views India as aiding the Tibetan cause, both by supporting the Dalai Lama and hosting the community-in-exile, in Dharamsala (Madhukar, 2018)

**Sri Lanka:** Sri Lanka’s relationship with China has strengthened, with billions of dollars of loans to the Sri Lankan government for new infrastructure projects. Sri Lanka, struggling to pay back its existing \$8 billion debt to China, made a deal leasing an 85% share of Hambantota port for 99 years to a Chinese state company, on 25th July 2017 (Basu, 2017). Chinese submarines have demonstrated capability to operate in the IOR, docking in Colombo in October 2014 (Srilal, 2014).

**Maldives:** India’s ties with Maldives have been impacted by China’s growing footprint, evinced by a rushed FTA with China. (Varma, 2017) and its backing for China’s BRI. Maldives had cancelled a deal with an Indian company for the upgradation of Male Airport and awarded it to a Chinese company during President Xi Jinping’s visit in September 2014 (Reuters, 2014) The relations became particularly bad in April 2018, when the Yameen regime asked India to take back two Dhruv helicopters gifted to Male in 2013 (Pandit, 2018)

**Bangladesh:** The real benefit for India of “neighbourhood first” approach is that Bangladesh has provided great strategic opportunity to change South-Asia’s geopolitical situation. During PM Sheikh Hasina’s visit to India, a credit line of \$4.5 billion with an additional \$500 million was extended, for defence hardware purchase (Janardhanan, 2018). Bangladesh has emerged as a key gateway for India’s sub-regional initiatives, the BIMSTEC and BBIN.

China has however made significant inroads into Bangladesh. Loans worth over \$24 billion have been given to build power plants, a seaport and railways (Blanchard, 2016). China has promised to step up defence ties, including personnel training and cooperation in equipment technology (MND, 2015). In addition, it plans to provide a significant \$9 billion low-interest loan to build six rail projects, including one close to the Indian border (Paul, 2016).

## Summary of Indian Security Policy

The competition within the IOR simplistically speaking, is one for access, use of ports and the securing of bases. China is trying to secure energy resources and reduce its dependence on the Strait of Malacca, and has laid forth its “BRI” initiative. India has the capability to build up its own capability as a “net security provider.” (Gates, 2009). Specifically, it has supported capacity building for Sri Lanka, Maldives, Seychelles, and Mauritius and has invested in ports at Sittwe and Chabahar.

The foundational principles of Indian approach comprise a policy of non-alignment, autonomy in security, flexibility in choosing one’s partners, and caution in working with bigger powers (Bajpai, 2017). As China inches to becoming one of the great powers, India is presented with a great power at its doorstep, which has competitive and hostile intent. This does not permit India the luxury of being non-committal or un-involved. India has adopted a pragmatic and realist approach, conducting its foreign policy on most occasions with caution and prudence, deterrence, keeping primacy

of sovereignty over interventionism in international affairs; working within existing frameworks rather than reshaping international institutions, a gradual accumulation of military power and engagement with neighbouring countries. India's priorities and strategic objectives could be prioritised as :

- Prioritising an integrated neighbourhood; "Neighbourhood First."
- Leveraging international partnerships to promote domestic development.
- Ensuring a stable and multipolar balance of power in the Indo-Pacific; "Act East."
- Dissuading Pakistan from supporting terrorism.
- Avoid Alliances of any kind, especially any military alliances.
- Form Bi-Lateral groupings compared to multi-lateral groupings.
- Maintain Strategic autonomy, but demonstrate pragmatism in keeping with national interests.
- Counter growing Chinese influence in the IOR

## **Impact on India's Security Policies Towards Japan**

India's security and foreign policies are intertwined to a very large degree and its gestures and actions towards one nation, have far reaching implications on its relationships with others. Whilst there are many factors that shape the Japanese perception towards India, the major ones are worth recalling.

- China has become as a major actor in international economics and politics.
- Aggressive Chinese actions over the Senkaku/Diaoyu Islands and the associated overlapping ADIZ over area claimed by Japan.

- Criticality of security of the SLOCs of the Indo-Pacific, as over 85% of Japan's crude oil comes from the Middle-East region. (Statista, 2018).
- The ongoing disputes over the island territories in the SCS affect peace and stability for transit through the Straits of Malacca, an extremely important requirement in Japan's perspective.
- China's ability to fragment the cohesion of the ASEAN Nations.
- China expanding dual-use infrastructure projects and political influence in the IOR.
- Uncertainty of US support as a long-term guarantor of Japan's security and a perception of decreasing US influence and interest in the region, as evident from withdrawals from the TPP, JCPOA. (Sidhu, 2017)
- Assessment that India has the economic, military and political potential to be an independent regional power, capable of countering China.
- Tapping the emerging market potential of India.

## **Benefits to India**

- India looks for investments from Japan at convenient rates for infrastructure development.
- Access to civil nuclear technology.
- Support for its territorial disputes.
- Support for freedom of the seas, peaceful settlement of disputes, including in the SCS (George, 2015).
- The prospect of support from an influential partner nation, while attempting to balance Chinese pressure.

**The China Factor:** The biggest factor in the calculations of both countries is obviously the growth and intentions of China. The prominent factors are :

- China strives to gain influence in South Asia, while India vies for the same in East Asia. The rivalry is apparent in the efforts of both countries to join and direct various regional organizations, while limiting the influence of the other.
- India is attempting to gain a seat on the UN Security Council and membership in the Nuclear Suppliers Group.
- China has bolstered Pakistan's military capabilities and accelerated development of Islamabad's nuclear weapons and missile programs (FAS, 2002). China has deepened its engagement with Bangladesh, Nepal and Sri Lanka, on the economic and strategic front (Dutta, 2017).
- India engages with Russia, Japan and US, all countries that China perceives to be working to contain it.
- India's provision of sanctuary in 1959 to Dalai Lama, who continues to be politically active in exile, along with approximately 130,000 Tibetans in India (Madhukar, 2018).
- Russia's perceived favoritism toward India, since the Soviet Union split with China and backing of India in the Sino-Indian War. But China's recent military cooperation with Russia has altered this dynamic (O'Connor, 2018).
- India's growing nuclear capabilities and modernizing missile force are perceived as a threat to China (Tao, 2018).
- Possibility of two-front conflict pitting India against China and Pakistan simultaneously, a concern accelerated by the CPEC (Katoch, 2018).

## **The Shaping of India's Security Policies**

China will remain India's neighbour, economic competitor and largest trading partner. China has boundary disputes with India and has brought them centre-stage by aggressive actions over the past five years. It has strategically indulged in predatory economics, to develop dependencies in the Indo-Pacific region and exert influence (Tillerson, 2017). China continues to actively support Pakistan in all its ventures and is actively pursuing a geo-economic expansionist policy with its BRI. Japan has felt threatened by both Russia and China and feels that it may not be completely able to depend on the US, for all its security needs. China has carried out massive development of the disputed islands in the SCS and East China Sea. Japan has modified its erstwhile pacific constitution becoming more militarily assertive and seeks partnerships and alliances with India and Australia, as also with other ASEAN nations.

There is the fact, of the growing relationship between India and US. In 2016, the relationship was elevated to a "Enduring Global Partners in the 21st Century" (MEA, 2017). There is increasing military engagement and co-operation, purchase of arms and support at all levels like the MCTR, NSG, STA-1, notwithstanding the friction over issues of tariffs and trade with Iran, that have emerged recently (Stacey, 2018).

The question does arise; is the present closeness between India-Japan and India-US, a form of reaction to the Thucydides trap, where these nations are coming together to tackle the fear generated of a growing China? This paper does not outrightly reject the idea. Since all countries play the game at a strategic realist level, the desire to partner, is probably inevitable. It is the degree to which this factor is taken into consideration, that ultimately determines a nation's policies. It is the paper's assessment, that in case of Japan, there is a larger probable, that the China factor is driving Japan closer to India.

India should continue to develop its strategic partnership with the US and India has much to gain from this relationship, especially as it grows

economically and stabilises militarily over the next decade. Next, India must stabilise its relationship with China, while demonstrating strength and resolve in safeguarding its core interests, simultaneously demonstrating concern and accommodation over other minor issues. It must build its relations with the other actors in the IOR region, creating a more localised form of balancing, by increasing defence partnerships with other regional powers (Pant, 2016).

### **Most Probable Shape of India's Engagement with Japan**

India's relationship with Japan will adopt the contours of a form of regional balancing. An alignment with Japan, in a way automatically includes US. Pure calculations would indicate that Japan has more to gain from a strong relationship with India, than India would gain from Japan.

North Korea figures very high in Japan's security calculus and hence India's relationship with North Korea has implications on the Indo-Japan relationship. India has had long standing, but low intensity diplomatic relations with North Korea (DPRK). It has not isolated the country, even when it remains convinced of the existing nexus between DPRK, Pakistan and China for nuclear weapons and ballistic missile technology (Rao, 2017).

The most serious disadvantageous consequence of a closer partnership with the US and Japan, is the potential problems posed for India's relationships with Russia and China. It would be of great benefit, if India could count on both the goodwill of US and Russia, to balance China. Though Russia also has concerns about China, increasing animosity with the US, has created co-operation and closer ties with China, complicating India's choices.

India and Japan desire similar strategic objectives, however not through identical methods. Both countries seek to manage the effects of the rise of China and limit its impact in their areas of interest. Japan is worried about a direct confrontation and will actively gather partners and allies

to present a strong and strident resistant front. India is concerned, but is relatively more economically engaged with China and less worried about its immediate physical threat, compared to Japan. As a result, India will be probably be less vocal in complaints about Chinese actions, preferring to handle the situation through other less confrontationist measures, when not directly threatened. Though, if directly confronted on boundary issues or similar core issues, India is likely to take a strong military stand and marshal all support from its partners. Both these aspects were visibly evident in India's handling of the Doklam confrontation.

In this context, in which India's choices are limited, regional balancing with caution (China and Russia factors) represents a necessary supplement to its other strategic efforts. Getting too close to the US has a strategic disadvantage in that, while the US gets a strong balancing partner, and so does India no doubt, but India gets a more determined enemy, in its immediate neighbourhood. India recognises only UN sanctions and does not consider individual country sanctions as legal or binding. In this context, even now, despite negotiations, no concessions are being granted to India for trade with Russia under the CAATSA (Rajghatta, 2018). Russia has been a relatively reliable strategic partner for decades and India has decided to go ahead with the purchase of the S-400 system despite US sanctions (Pandit, 2018).

Regional balancing is a possible strategy, India could pursue to align with Japan, Vietnam, Australia and other ASEAN countries, in order to balance against China. There are many advantages from such an approach. It gives India the option of balancing China without the disadvantage of aligning with another great power such as the US. This is also domestically convenient, as the Indian population are very receptive to the idea of enhancing ties with Southeast and East Asia. Also, unlike an alignment with another great power, India would likely be the more significant partner in regional alignments and relationships in Asia, where only Japan is of comparable power.



India has to be able to maintain a viable and constructive dialogue with China at all levels, so as to seek a resolution to its boundary disputes. India has to demonstrate resolve and restraint, strength and pliability, compromise and firmness all at the same time with China, during this period of engagement. Russia is India's major international partner and continues to be the largest unconditional arms supplier. India also has to assuage Russian sentiment and reassure it of the strength of its relationship. Therefore, India must partner Japan at all levels, but not to the extent that it affects or compromises its other relationships.

## **Conclusion**

India has an immensely favorable geo-politically strategically important location in the Indian-Ocean Region and has gradually assumed the status of a regional power. India has good relations with Japan, US, Russia, Australia and most of the ASEAN nations. It has a difficult relationship with China, but has engagements and inter-dependencies at various other levels. Japan under PM Abe has managed to make significant alterations in the interpretation of its Constitution, passing important Acts and Laws, that allow its forces to use force when required.

India has shown steady trajectory of economic growth and has begun acting out its "Act East" Policy under PM Modi. India is engaging increasingly with China, whilst having a military standoff over its boundary issues. It is increasingly engaging economically with all ASEAN countries and China. Japan feels increasingly threatened with the growing power of China and the apparent reduction in US presence and involvement in the Indo-Pacific. Consequently, Japan has become assertive and has taken specific military tactical steps to deal with Chinese activities in the region.

In furthering its relationship with an assertive Japan, India accrues the advantage of having strong relationship with an economically strong and influential partner. It serves to counter-balance China when required. The peripheral factors and consequences of the strong US-Japan alliance can

also be taken advantage of, when required. Too strong an alliance with Japan, would probably serve to give China a feeling of being cornered and may result in increased animosity. Being clubbed with Japan for a permanent seat on the UNSC, invites a definite Chinese veto, which is not to India's advantage. India's approach to its relationship with Japan will be steady and strong, however may not be at the pace that Japan desires.

India's long term strategic objective would be to have a predominant influence in the Indian Ocean region enforceable with a strong all round military capability, a seat on the United Nations Security Council, a strong economy, resolution of its boundary issues with China, a reasonable status quo with Pakistan and good relations with all its other neighbours.

India would have to continue its engagements with all players and shape them so that they match our requirements. It will have to clearly identify its long term strategic objectives and orchestrate its military economic and diplomatic capability to achieve them. India cannot afford to display narrow stances or abstract idealism. It will have to be pragmatic, realist, balance its options, hedge selectively when it must and handle each relationship and event, case by case, keeping the actions in consonance with its strategic long term objective.

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Air Commodore Inderpal Singh Walia, AVSM, VM, ndc was born on 2nd November 1967 and schooled in various institutions in different parts of India. He graduated from the 72nd Course of the National Defence Academy. He earned his pilot's wings and was commissioned into the Indian Air Force on 11 June 1988. He has flown a variety of fighter aircraft during his active career and is operational on all variants of the MiG-21, MiG-23, MiG-27, Jaguar and Su-30 MKI. He is a Fighter Strike Leader from the prestigious Tactics and Air Combat Development Establishment IAF (TACDE) and had graduated with top honours. He has also had the distinction of serving two tenures as Directing Staff at TACDE, during which he was responsible for conduct of training. He is also a qualified Instrument Rating Instructor and Examiner. He has undergone the Advanced Command and Staff Course from JSCSC, Shrivenham and MA from Kings College, London. He has commanded a frontline Fighter Squadron and served in the Directorate of Air Staff Inspection (DASI) at Air HQ IAF. He has also served on the personal staff of two Chiefs of Air Staff, IAF. He has been the Defence Attaché to Japan and South Korea was the Commandant of TACDE, IAF. He has commanded an operational frontline fighter base which had a large number of air assets. He has been awarded the Vayu Sena Medal for distinguished flying and the Ati Visihist Seva Medal for distinguished service of a high order. He is a voracious reader and plays most games.

# **SINO-US COMPETITION IN SOUTHEAST ASIA: OPPORTUNITIES AND CHALLENGES FOR BANGLADESH**

**Brigadier Syed Imran Raza Naqvi, TJ, nswc, ndc, psc**

## **Introduction**

### **ASEAN Countries and Their Dynamics in the Region**

Southeast Asia is a region characterized by geographical and political complexity.<sup>1</sup> In contemporary definition, Southeast Asia consists of two geographic regions:

- The Mainland area of Southeast Asia comprising the populous nation Vietnam, the poor landlocked economy of Laos, the post-conflict society of Cambodia, Thailand, Myanmar a country coming out of half a century of autarkic military rule and the market-oriented economy of Malaysia.
- The Maritime area of Southeast Asia comprising the diverse middle-income economy of Indonesia, the wealthy entrepot Singapore, the Philippines and the small but rich oil kingdom of Brunei.<sup>2</sup>

### **Formation of ASEAN**

The Association of Southeast Asian Nations (ASEAN) was created by Thailand, Malaysia, Singapore, the Philippines and Indonesia in 1967. ASEAN was later joined by Brunei, Vietnam, Laos, Burma and Cambodia. The ASEAN Community is comprised of three pillars, the Political-Security Community, Economic Community and Socio-Cultural Community. The

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2 Ibid

strong focus on state sovereignty and non-interference underscores the limitations as well as advantages of the organization.<sup>3</sup>

## ASEAN Member States

An overview of individual ASEAN member states is as follows:

- **Indonesia:** Foreign policy makers of Indonesia aim the country to have limited alignments in modern Southeast Asia. Jakarta has been expanding its bilateral relations with Beijing in areas of trade, investment, education and defence cooperation. However, it has emphasized the need for a U.S. presence to counter balance the threat of China's rising power.<sup>4</sup>
- **Philippines:** Filipino presidents have historically pivoted towards Washington as the ally. Nonetheless, Rodrigo Duterte as the President has introduced a taggering shift in the Philippines' foreign relations, reopening the dormant communication channels with the leadership in Beijing.
- **Singapore:** Singapore has adhered to its tried-and-tested formula of being relevant and friendly with all the major powers of the region.<sup>5</sup> Singapore is the United States' sixth largest Asian trading partner. It is also the largest recipient of Chinese FDI in ASEAN.<sup>6</sup>
- **Vietnam:** One of the major concerns of Vietnamese policy makers is an increasing Vietnamese dependence on China as the principal supplier for its export-oriented economy.<sup>7</sup> Vietnam considers the U.S. to be one of its most important partners as it has become one of the leading sources of FDI in Vietnam.<sup>8</sup>

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3 Ibid

4 LaksmanaEvan A, China, the United States and the Future of Southeast Asia: Pragmatic Equidistance, New York University Press, New York, 2017.

5 Yee-KuangHeng 2017, China, the United States and the Future of Southeast Asia: economic and strategic trends in Southeast Asia, New York University Press, New York.

6 Ibid

7 ThuyTran Truong2017, China, the United States and the Future of Southeast Asia:Tightrope Walking over the Sea of Trouble, Vietnam's Foreign Policy, New York University Press, New York.

8 Ibid



- **Malaysia:** Currently, Malaysia and China are strong trading partners. On the other hand, U.S. and Malaysia have sustained military, security and trade cooperation.<sup>9</sup> With the arrival of Prime Minister Mahathir Mohamad, it is probable that Malaysia will pursue equidistance from countries such as the United States and China, through a more integrated ASEAN partnership.<sup>10</sup>
- **Laos, Cambodia and Myanmar:** Thailand, Laos, Cambodia and Myanmar could never manage to form a coherent group of polities.<sup>11</sup> It is expected that Myanmar will go through a period of consolidation both for the government and foreign expectations towards this government. However, Myanmar is in danger of renewed isolation over the Rohingya issue.<sup>12</sup>
- **Thailand:** At present, Thailand is the only treaty ally of the U.S. on mainland Southeast Asia, but a country that arguably has the closest and most comfortable relationship with China of any Southeast Asian state.<sup>13</sup> Thailand's importance to mainland Southeast Asia will be maintained by the new web of road and rail transportation links that is critical to China's Trans-Asian Railway.<sup>14</sup>
- **Brunei Darussalam:** Brunei and China share long-standing arrangements in trade and investment.<sup>15</sup> Trade between the United States and Brunei in 2016 totalled \$628 million.<sup>16</sup>

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9 Ahmed Zakaria 2017, *China, the United States and the Future of Southeast Asia: Not between Scylla and Charybdis*, New York University Press, New York.

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## ASEAN 2018

Heads of ASEAN Member States gathered in Singapore for the 32nd ASEAN Summit on 28 April 2018. As Singapore takes on the chairmanship, initiatives that will be spearheaded for improving trade facilitation and creating of a network of smart cities across ASEAN. ASEAN realises the significance of creating a single market and production base characterized by free flow of goods, services, and investments.<sup>17</sup>

**ASEAN and China:** ASEAN and China are working to operationalize the Code for Unplanned Encounters in the South China Sea, which ASEAN hopes will be expanded to include the non-military coast guard and para-military forces.<sup>18</sup>

**ASEAN and the U.S:** In the U.S.-ASEAN Dialogue held in Kuala Lumpur, on 03 April 2018, representatives reaffirmed their commitment to the rules-based order and to the ASEAN-centered regional architecture.<sup>19</sup>

**The Rohingya Issue:** The volatile situation in the Rakhine State of Myanmar may yet put ASEAN again in an uncomfortable position, especially if the humanitarian crisis escalates. The Rohingya issue will test ASEAN's credibility and capacity in managing intra-mural conflicts.<sup>20</sup>

## The U.S. Strategic Interest in Southeast Asia

### History of the U.S. in Southeast Asia

During the Cold War, as part of its global containment strategy the U.S. provided advice and assistance to the Philippines in its long-running struggle with communist insurgents. Later on, Southeast Asia developed

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17 Singh Daljit January 2018, 'Southeast Asia Outlook 2018', ISEAS – YusofIshak Institute [online], April 2018. <[https://www.iseas.edu.sg/images/pdf/ISEAS\\_Perspective\\_2018\\_1.pdf](https://www.iseas.edu.sg/images/pdf/ISEAS_Perspective_2018_1.pdf)>

18 Mun Tang Siew January 18, 'Southeast Asia Outlook 2018', ISEAS – YusofIshak Institute [online], April 2018. <[https://www.iseas.edu.sg/images/pdf/ISEAS\\_Perspective\\_2018\\_1.pdf](https://www.iseas.edu.sg/images/pdf/ISEAS_Perspective_2018_1.pdf)>

19 U.S. Mission to ASEAN Press Statement: U.S. ASEAN Dialogue [online], April 3, 2018. <<https://asean.usmission.gov/press-statement-u-s-asean-dialogue-april-3-2018/>>

20 Mun Tang Siew January 2018, 'Southeast Asia Outlook 2018', ISEAS – YusofIshak Institute [online], April 2018. <[https://www.iseas.edu.sg/images/pdf/ISEAS\\_Perspective\\_2018\\_1.pdf](https://www.iseas.edu.sg/images/pdf/ISEAS_Perspective_2018_1.pdf)>

into a place of high interest to the U.S. corporations and banks as the region enjoyed explosive economic growth.<sup>21</sup>

## **U.S. Pivot to Asia**

ASEAN members welcomed the inauguration of President Obama, who expressed a desire to be the first Pacific President. The U.S. Pivot was driven by the recognition that U.S. policy needed to focus more heavily on the strategically important and economically vibrant Asia-Pacific.<sup>22</sup> The US mission to ASEAN was established in Jakarta in 2010. The ASEAN-US Strategic Partnership was established in 2015.<sup>23</sup>

## **The Trump Presidency**

2017-18 saw the implementation of President Trump's 'America First' philosophy and policies in the form of the National Security Strategy (NSS) and the National Defense Strategy (NDS). The NSS contends that China seeks to displace the US as the paramount power in order to achieve regional hegemony and ultimately global pre-eminence.

One of the biggest changes between the 2015 NSS and the 2017 NSS is that the phrase "Asian pivot" or "rebalance" is gone. However, while Trump's Indo-Pacific policy rejects multilateral trade deals, the 2017 NSS pledges to expand Indo-Pacific alliances and partnerships to create a security architecture capable of maintaining stability.<sup>24</sup>

**Implications of NSS and NDS for Southeast Asia:** The geopolitical implications of the NSS and NDS for Southeast Asia are significant. An

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21 Ott Marvin C 2017, *China, the United States and the Future of Southeast Asia*: U.S. Security Strategy and Southeast Asia, New York University Press, New York.

22 Murphy Ann Marie Clinton 2017, *China, the United States and the Future of Southeast Asia*: ASEAN's External Policy, New York University Press, New York.

23 Liow Joseph ChinyongLe August 2017, 'Southeast Asian perspectives on US-China competition: Southeast Asia in the US Debate', Lowy Institute [online], April 2018. <<https://www.lowyinstitute.org/publications/southeast-asian-perspectives-us-china-competition>>

24 Storey Ian February 2018, 'Southeast Asia Outlook 2018: The Trump Administration's 2017 National Security Strategy and 2018 National Defense Strategy', ISEAS – Yusof Ishak Institute [online], April 2018. <[https://www.iseas.edu.sg/images/pdf/ISEAS\\_Perspective\\_2018\\_9@50.pdf](https://www.iseas.edu.sg/images/pdf/ISEAS_Perspective_2018_9@50.pdf)>

intensification of Sino-US rivalry in the region would greatly complicate Southeast Asia's security environment and the foreign policy decision-making processes of regional states, increase tensions in the South China Sea and put further stress on ASEAN unity and hence its centrality in the regional security architecture.<sup>25</sup> Not only will Trump's proclivity for bilateralism effectively side-line ASEAN, but the ideologically different world view of his administration over rivalry with China will further downgrade Southeast Asia's strategic value.<sup>26</sup>

## Chinese Strategic Interests in Southeast Asia

### History of China in Southeast Asia

With the emergence of the North American Free Trade Arrangement and the European Union, China realized the need to become more committed to regional cooperation. China had two options: either build a Free Trade Agreement with Japan and South Korea, its Northeast Asian neighbours or form one with Southeast Asian countries.

**ASEAN vs Northeast Asia:** China chose ASEAN rather than its Northeast Asian neighbours as partners. The building of an FTA block with ASEAN countries was a direct result of China's anticipation that ceding more economic interests to its Southeast Asian neighbours would help stabilize its political relationship with these countries and at the same time counter the 'China Threat' perception.<sup>27</sup>

### China and ASEAN

Since 2009, China has replaced the United States as the largest trading partner of ASEAN.<sup>28</sup> China and Southeast Asia saw an increase of 8.3

25 Ibid.

26 Laksmana Evan A August 2017, 'Southeast Asian perspectives on US-China competition: Asean Centrality in the South China Sea', Lowy Institute [online], April 2018. <<https://www.lowyinstitute.org/publications/southeast-asian-perspectives-us-china-competition>>

27 Shaofeng Chen 2017, *China, the United States and the Future of Southeast Asia: China's Economic Approach to ASEAN*, New York University Press, New York.

28 Ibid

percent in mutual trade over 2013, with the total value of trade reaching US\$480.3 billion in 2014. By the end of 2013, the cumulative ASEAN investment in China accounted for 6.6 percent of the total Chinese FDI.<sup>29</sup>

The Asian Infrastructure Investment Bank (AIIB) is widely considered an indicator of China's growing international influence.<sup>30</sup> The projects the bank funds include linkages between countries in the region and cross-border infrastructure projects in Southeast Asia.<sup>31</sup>

Energy has become a central factor in shaping China's geopolitical and diplomatic standing in key oil and gas exporting countries and regions. For future supplies, China's oil and gas imports will increasingly have to transit a series of vulnerable maritime chokepoints through sea lanes of Southeast Asia.

## **The South China Sea Dispute**

The South China Sea including its islands remains one of the major territorial disputes China has today in Asia. It has disputes with Vietnam, the Philippines, Brunei and Malaysia.

**South China Sea Arbitration:** In April 2012, Chinese and Philippines ships had a tense stand off at Scarborough shoal. Philippines filed its case at the UNCLOS in January 2013 and in 2016 the United Nations Arbitral Tribunal ruled in favour of Philippines.<sup>32</sup> Chinese activity in the South China Sea has appeared to have slowed down after the arbitral tribunal hearing. This apparent lull in the South China Sea may be attributed to an upturn in bilateral relations with the Philippine Government under Rodrigo Duterte.<sup>33</sup>

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29 Shulong Chu 2017, *China, the United States and the Future of Southeast Asia: China and the United States in Southeast Asia*, New York University Press, New York.

30 Ott Marvin C 2017, *China, the United States and the Future of Southeast Asia: U.S. Security Strategy and Southeast Asia*, New York University Press, New York.

31 <<https://www.investopedia.com/terms/a/asian-infrastructure-investment-bank-aiib.asp>> (accessed online, May 2018)

32 <<http://globalnation.inquirer.net/140358/philippines-arbitration-decision-maritime-dispute-south-china-sea-arbitral-tribunal-unclos-itlos>> (accessed online, May 2018)

33 Liow Joseph Chinyong Le August 2017, 'Southeast Asian perspectives on US-China competition: Southeast Asia in the US Debate', Lowy Institute [online], April 2018. <<https://www.lowyinstitute.org/publications/southeast-asian-perspectives-us-china-competition>>

## **The U.S. and China in Southeast Asia - A Comparative Study**

### **Sino-U.S. Strategic Disconnect**

A fundamental disconnect can be seen in Southeast Asia between the core strategic interests of the United States and China. This threatens to undermine the regional security architecture. Beijing is prepared to challenge the prevailing US-led global order and present possible alternatives. The United States, on the other hand, will not compromise its own imperative of primacy.<sup>34</sup>

### **China-U.S-ASEAN Linkages**

Both China and the United States see Southeast Asia as important in its own right and are willing to exert considerable effort there to promote their interests. Both want access to and influence in Southeast Asia and have invested enough, economically and strategically, to be true competitors there.<sup>35</sup> As a result, both have a desire to avoid conflict in Southeast Asia; however hindrance is created by the strikingly different operating styles of the two states. The U.S. prefers market-oriented economic policies, while China is most comfortable relying on state-owned or state-controlled enterprises to carry out its plans.<sup>36</sup>

**The South China Sea Dispute:** In case of the South China Sea dispute, the bigger security interests lies in China's relationship with the United States. Due to the U.S. alliance with the Philippines, and its interest in the sea lanes, the U.S. is also a claimant of the South China Sea along with China and Southeast Asia.<sup>37</sup> Both China and the U.S. have increased military activity in

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34 Liow Joseph Chinyong Le August 2017, 'Southeast Asian perspectives on US-China competition: Southeast Asia in the US Debate', Lowy Institute [online], April 2018. <<https://www.lowyinstitute.org/publications/southeast-asian-perspectives-us-china-competition>>

35 Denoon David B H 2017, *China, the United States and the Future of Southeast Asia: Conclusion*, New York University Press, New York.

36 Ibid.

37 Shulong Chu 2017, *China, the United States and the Future of Southeast Asia: China and the United States in Southeast Asia*, New York University Press, New York.

the South China Sea in 2018 by conducting a series of naval manoeuvres and exercises stepping up naval presence in the region.<sup>38</sup>

## **Southeast Asian Hedging**

Southeast Asian hedging in the face of rising Chinese power is a common trend and the United States is well-positioned to benefit from this broad trend in the region. Southeast Asian leaders are keen to enhance their nationalistic ambitions but countries like China have territorial ambitions directly at odds with their national interests. This is why the United States has the added advantage of being seen in Southeast Asian governments as the 'least distrusted power'.<sup>39</sup> However, Chinese economic stagnation or decay would probably be worse than strengthened Chinese competitiveness for Southeast Asia.<sup>40</sup>

## **Trade War**

On 6th July 2018 the U.S. imposed tariffs on \$34 billion worth of Chinese goods. China promptly matched this move with tariffs of its own. President Trump has threatened tariffs on \$500 billion dollars in trade, equivalent to all the goods the U.S. imports from China.<sup>41</sup> Southeast Asian nations are seen as vulnerable to Trump's tariffs. The main reason is that these countries are a significant contributor to Chinese exports that are headed towards the U.S. If U.S-China tensions evolve into a full-scale trade war, export-oriented Asian economies could emerge as the biggest losers.<sup>42</sup>

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38 'Territorial Disputes in the South China Sea' 12 July 2018, Council on Foreign Relations [online], July 2018. <[https://www.cfr.org/interactives/global-conflict-tracker?cid=ppc-Google-grant-conflict\\_tracker-031116&gclid=CO7uruyKq9ECFYZLDQodhDEDyw#!/conflict/territorial-disputes-in-the-south-china-sea](https://www.cfr.org/interactives/global-conflict-tracker?cid=ppc-Google-grant-conflict_tracker-031116&gclid=CO7uruyKq9ECFYZLDQodhDEDyw#!/conflict/territorial-disputes-in-the-south-china-sea)>

39 Liow Joseph Chinyong Le August 2017, 'Southeast Asian perspectives on US-China competition: Southeast Asia in the US Debate', Lowy Institute [online], April 2018. <<https://www.lowyinstitute.org/publications/southeast-asian-perspectives-us-china-competition>>

40 Sutter Robert 2008, *China, the United States and Southeast Asia: Is a China-centred order marginalizing the United States?* Routledge, New York.

41 Financial Times [online], July 2018. <<https://www.ft.com/content/6959ee06-8222-11e8-96dd-fa565ec55929>>

42 ChandranNyshka May 2018, 'How Trump's China tariffs could hit the rest of Asia', CNBC [online], June 2018. <<https://www.cnbc.com/2018/05/03/trump-china-tariffs-could-hit-rest-of-asia.html>>

## Themes Impacting the Strategic Environment

The strategic environment of Southeast Asia could directly be impacted by three major Sino-U.S. themes in the NSS and NDS:

- In the case of a more Sino-U.S. competitive dynamic, the regional security environment would make it harder for Southeast Asian states to balance their relations with America and China.
- U.S. administration may seek to counteract Beijing's assertiveness in the South China Sea. Beijing will respond by increasing its military presence on its artificial islands.
- The NSS pledges to strengthen America's partnerships with Southeast Asian countries. To do so, America is required to boost arms sales to regional states, increase combined military exercises and pre-position military equipment overseas. China's response will be to look to expand its defence diplomacy activities in the region with port visits, combined exercises and arms sales.<sup>43</sup>

## ASEAN's Dilemma

The continuing reluctance of Southeast Asian officials to move under China's sway and their determination to develop ties with other powers appear to demonstrate that Asia is not going towards a Sino-centric order.<sup>44</sup> However, US economic interests in the region have been set back due to the avowed disdain in the Trump administration for multilateral trade and economic initiatives.<sup>45</sup> Such an environment of escalating US-China rivalry would greatly complicate Southeast Asia's strategic situation and the foreign policy decision-making processes of these regional states.<sup>46</sup>

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43 Storey Ian February 2018, 'Southeast Asia Outlook 2018: The Trump Administration's 2017 National Security Strategy and 2018 National Defense Strategy', ISEAS – Yusof Ishak Institute [online], April 2018. <[https://www.iseas.edu.sg/images/pdf/ISEAS\\_Perspective\\_2018\\_9@50.pdf](https://www.iseas.edu.sg/images/pdf/ISEAS_Perspective_2018_9@50.pdf)>

44 Sutter Robert 2008, *China, the United States and Southeast Asia: Is a China-centred order marginalizing the United States?* Routledge, New York.

45 Liow Joseph Chinyong Le August 2017, 'Southeast Asian perspectives on US-China competition: Southeast Asia in the US Debate', Lowy Institute [online], April 2018. <<https://www.lowyinstitute.org/publications/southeast-asian-perspectives-us-china-competition>>

46 Storey Ian February 2018, 'Southeast Asia Outlook 2018: The Trump Administration's 2017 National Security Strategy and 2018 National Defense Strategy', ISEAS – Yusof Ishak Institute [online], April 2018. <[https://www.iseas.edu.sg/images/pdf/ISEAS\\_Perspective\\_2018\\_9@50.pdf](https://www.iseas.edu.sg/images/pdf/ISEAS_Perspective_2018_9@50.pdf)>



## Outlook

The United States and China are both acutely aware that neither would benefit from any conflict in Southeast Asia.<sup>47</sup> Both are expanding cooperation in all realms serving their mutual interests. This shows China and the United States are pursuing parallel policies of pragmatic and mutual engagement. Here is where Southeast Asia can conceivably rise above its role of simply serving inadvertently as the arena for major power rivalry to play out.<sup>48</sup> The Southeast Asian goal can be to bring about some degree of political convergence so that both great powers will have a stake in preserving Southeast Asia's autonomy and promoting its prosperity.<sup>49</sup> In the years ahead, ASEAN and its constituent states will need stronger leadership and stronger institutions, if they are to help steer Beijing and Washington away from confrontation.<sup>50</sup>

## Implications of Sino - U.S. - ASEAN Link on Bangladesh

Bangladesh's geographical location between two major regions of Asia—South Asia and Southeast Asia—provides a unique opportunity for the country to benefit from greater cross-border movement of goods and services, investment flows, and enhanced human contact. However, Bangladesh is one of the most disengaged countries in the region, deprived of its status as a key node on the silk route.<sup>51</sup> In order to take advantage of the ever-changing economic scenario fuelled by the Sino-US-ASEAN link prevailing within the Southeast Asian region, Bangladesh needs to make effective inroads into the complex environment. The potential role

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47 Godwin Paul H B 2008, *China, the United States and Southeast Asia: China as a Major Asian Power: The Implications of its Military Modernization*, Routledge, New York.

48 Liow Joseph Chinyong Le August 2017, 'Southeast Asian perspectives on US–China competition: Southeast Asia in the US Debate', Lowy Institute [online], April 2018. <<https://www.lowyinstitute.org/publications/southeast-asian-perspectives-us-china-competition>>

49 Goh Evelyn and Simon Sheldon W 2008, *China, the United States and Southeast Asia: Introduction*, Routledge, New York.

50 Connelly Aaron L August 2017, 'Southeast Asian perspectives on US–China competition: Introduction', Lowy Institute [online], May 2018. <<https://www.lowyinstitute.org/publications/southeast-asian-perspectives-us-china-competition>>

51 Rahman Mustafizur, Moazzem Khondaker Golam, Chowdhury Mehruna Islam, and Schrin Farzana September 2014, 'Connecting South Asia and Southeast Asia: A Bangladesh Country Study', Asian Development Bank Institute [online] June 2018. <<https://www.adb.org/sites/default/files/publication/154305/adbi-wp500.pdf>>

that Bangladesh can play in the region is directly related to the strategic significance of the Bay of Bengal.

## Strategic Significance of Bay of Bengal

The Bay of Bengal is a key strategic sub-region within the Indian Ocean Region (IOR), functioning as a “hinge” between the Indian and Pacific Oceans, but it is one of the least explored or extracted offshore and inshore regions.<sup>52</sup>

While ASEAN’s attention has been predominantly focused on its eastern seaboard, there have been calls for stronger links to be developed with actors to its West as well. More immediate attention can be directed to the most proximate section of the Indian Ocean, as well as to the key strategic locations in the region, particularly the Bay of Bengal.<sup>53</sup>

**Importance of ASEAN-IOR Interconnection:** A section of the IOR, particularly the Bay of Bengal, is geographically proximate to the ASEAN region. ASEAN has high economic and strategic stakes in the security of the SLOCs in the Bay of Bengal as any tensions or security threats in this sub-region impinge directly on the significant levels of regional trade and energy supplies transiting these sea lanes.<sup>54</sup> SLOC of this area are critically located as they are conduits for the transit of energy supplies from the Gulf States to the economic powerhouses of Southeast Asia.<sup>55</sup> China is making increasing forays into the IOR leading to great power plays in the Bay of Bengal, so engagement with the Bay states along areas of common interest will provide a credible spring board for an increased ASEAN presence in the IOR.<sup>56</sup>

52 GamageRajni 2017, ‘ASEAN and the Indian Ocean, Bay of Bengal: What implications for ASEAN?’ S.Rajaratnam School of International Studies [online] June 2018 <<https://www.rsis.edu.sg/wp-content/uploads/2017/08/Monograph33.pdf>>

53 Yong Ong Keng September 2014, ‘ASEAN and the Indian Ocean: Foreword’, S. Rajaratnam School of International Studies [online] June 2018. <<https://www.rsis.edu.sg/wp-content/uploads/2017/08/Monograph33.pdf>>

54 GamageRajni 2017, ‘ASEAN and the Indian Ocean, Bay of Bengal: What implications for ASEAN?’ S.Rajaratnam School of International Studies [online] June 2018. <<https://www.rsis.edu.sg/wp-content/uploads/2017/08/Monograph33.pdf>>

55 GamageRajni, Bateman Sam and Chan Jane 2017, ‘ASEAN and the Indian Ocean: Introduction’, S. Rajaratnam School of International Studies [online], June 2018. <<https://www.rsis.edu.sg/wp-content/uploads/2017/08/Monograph33.pdf>>

56 GamageRajni 2017, ‘ASEAN and the Indian Ocean, Bay of Bengal: What implications for ASEAN?’ S.Rajaratnam School of International Studies [online] June 2018. <<https://www.rsis.edu.sg/wp-content/uploads/2017/08/Monograph33.pdf>>

## **Current Connectivity of Bangladesh in the Region: BIMSTEC**

The Bay of Bengal Initiative for Multi-Sectoral Technical and Economic Cooperation (BIMSTEC) is a regional organization comprising seven Member States lying in the littoral and adjacent areas of the Bay of Bengal including Bangladesh, Bhutan, India, Nepal, Sri Lanka, Myanmar and Thailand.<sup>57</sup> BIMSTEC's mission to deepen regionalism will stand a better chance of succeeding, if its members make the organization a priority, endow it with adequate resources, and enact reforms to strengthen its capabilities.<sup>58</sup>

### **Bilateral Ties of Bangladesh with China**

China's foreign assistance to Bangladesh amounts to about US\$1 billion a year. Additionally, a \$24 billion lending program, promised by China's President Xi Jinping during his visit in October 2016 is getting underway.<sup>59</sup> Additionally in February 2018 the AIIB approved a \$60 million loan to develop a 220-megawatt combined cycle power plant in Bhola.<sup>60</sup> China is also currently involved in upgrading the US\$8.7 billion Chattogram port in Bangladesh.<sup>61</sup> China is Bangladesh's largest trading partner and supplier of military equipment.<sup>62</sup>

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57 <<https://bimstec.org/>> (accessed online, June 2018).

58 Constantino Xavier February 2018, 'Bridging Bay of Bengal: Toward a Stronger BIMSTEC', Carnegie India [online], June 2018. <<https://carnegieindia.org/2018/02/22/bridging-bay-of-bengal-toward-stronger-bimstec-pub-75610>>

59 Cookson Forrest and Joehn Tom Felix April 2018, 'China and India's geopolitical tug of war for Bangladesh', East Asia Forum [online], June 2018. <<http://www.eastasiaforum.org/2018/04/11/china-and-indias-geopolitical-tug-of-war-for-bangladesh/>>

60 <<https://www.thedailystar.net/country/asian-infrastructure-investment-bank-aiib-approves-60mn-loan-for-bangladesh-power-project-1540462>> (accessed online, June 2018)

61 Gamage Rajni 2017, 'ASEAN and the Indian Ocean, Bay of Bengal: What implications for ASEAN?' S.Rajaratnam School of International Studies [online] June 2018. <<https://www.rsis.edu.sg/wp-content/uploads/2017/08/Monograph33.pdf>>

62 'Bangladesh and Bangladesh-U.S. Relations Congressional Research Service' October 2017, Congressional Research Service [online], June 2018. <[https://www.everycrsreport.com/files/20171017\\_R44094\\_791707d4a965516ac0be0b7c334e693d3343967e.pdf](https://www.everycrsreport.com/files/20171017_R44094_791707d4a965516ac0be0b7c334e693d3343967e.pdf)>

## **Bilateral Ties of Bangladesh with the U.S.**

The United States and Bangladesh have generally enjoyed a positive working relationship. The two nations hold an annual Partnership Dialogue and a Security Dialogue and have developed a cooperative relationship over the years to meet shared concerns. Bangladesh participates in the State Department's Anti-terrorism Assistance program and PACOM conducts naval exercises with Bangladesh. In 2015, U.S. Foreign Direct Investment (FDI) in Bangladesh amounted to \$589 million—an increase of 24.3% from 2014 and for the fiscal year 2018, the Trump Administration requested about \$138 million in foreign-assistance funding for Bangladesh.<sup>63</sup>

## **Becoming Significant to ASEAN**

The following characteristics of Bangladesh affect its significance in the Southeast Asian environment:

- Blue Economy refers to sustainable use of ocean resources for economic growth, improved livelihoods and jobs, and ensuring a healthy ocean ecosystem.<sup>64</sup> ASEAN is showing a keen interest in this trend and Bangladesh is by far the most assertive in leading the discourse on the Blue Economy.<sup>65</sup>
- Through referral to international arbitration, Bangladesh has played an exemplary role in resolving its maritime disputes with India and Myanmar. This willingness to following the path of negotiations over a more muscular form of diplomacy makes Bangladesh particularly relevant to ASEAN states involved in maritime disputes within the South China Sea.<sup>66</sup>

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63 Ibid.

64 'Blue Economy Becomes the Future of ASEAN-India Cooperation' November 2017, Ministry of Foreign Affairs Republic Of Indonesia[online], June 2018. <<https://www.kemlu.go.id/en/berita/berita-perwakilan/Pages/Blue-Economy-Becomes-the-Future-of-ASEAN-India-Cooperation.aspx>>

65 Manik Shaikh RezanulHaque February 2018, 'Blue Economy: A New Prospect for Bangladesh', Daily Sun [online], June 2018. <<http://www.daily-sun.com/printversion/details/290283/Blue-Economy:-A-New-Prospect-for-Bangladesh>>

66 GamageRajni 2017, 'ASEAN and the Indian Ocean, Bay of Bengal: What implications for ASEAN?' S.Rajaratnam School of International Studies [online] June 2018 <<https://www.rsis.edu.sg/wp-content/uploads/2017/08/Monograph33.pdf>>

- There is a dearth of institutionalization in the Bay of Bengal in comparison to the ASEAN in terms of maritime security governance. More comprehensive mechanisms like the Indian Ocean Rim Association are addressing maritime security but only to a limited extent.<sup>67</sup>

## Recommendations for Bangladesh

Bangladesh cannot escape the imperative of having to conduct its foreign policy in the context of the complex relationship between the U.S., China and ASEAN. The following recommendations could help point Bangladesh towards an effective way forward within the complex regional environment:

- **Strengthening Regional Integration:** Boosting intra-regional trade could be Bangladesh's best safeguard against any potential escalation between Washington and Beijing. For this Bangladesh needs to strengthen regional integration. It can start off these efforts by strengthening BIMSTEC. The organization requires an empowered secretariat and prioritization of sustained physical connectivity.<sup>68</sup>
- **Establishing Cooperative Security in the Bay of Bengal:** Bangladesh needs to determine the priority areas for maritime security cooperation in the region and the ways in which these priorities can be addressed at the tactical and strategic levels. It needs to determine the nature of cooperation among states, i.e. with respect to norms of sovereignty, cooperation between coastguards and navies, coordination with law enforcement agencies on land, etc.<sup>69</sup>

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<sup>67</sup> Ibid.

<sup>68</sup> Constantino Xavier February 2018, 'Bridging Bay of Bengal: Toward a Stronger BIMSTEC', Carnegie India [online], June 2018. <<https://carnegieindia.org/2018/02/22/bridging-bay-of-bengal-toward-stronger-bimstec-pub-75610>>

<sup>69</sup> Gamage Rajni 2017, 'ASEAN and the Indian Ocean, Bay of Bengal: What implications for ASEAN?' S.Rajaratnam School of International Studies [online] June 2018. <<https://www.rsis.edu.sg/wp-content/uploads/2017/08/Monograph33.pdf>>

- **Balancing between China and the U.S:** Bangladesh has healthy bilateral ties with both China and the U.S. Regional ambitions can be detrimentally affected by aligning to one great power. An independent foreign policy and establishing greater strategic ties with ASEAN can be advantageous to Bangladesh.
- **Addressing Non-Traditional Security Threats:** Any attempt to foster greater connectivity in the Bay and by extension in Southeast Asia, must take non-traditional security threats into account. These include the trafficking of narcotics, weapons, and people and the illegal exploitation of natural resources.<sup>70</sup>
- **Harnessing Blue Economy:** The delimitation of sea boundary with Myanmar and India has indeed opened up a new window of opportunities for Bangladesh. However, the delta of Bangladesh and its maritime territory have yet to be completely exploited.<sup>71</sup> In order to effectively harness the Blue Economy, Bangladesh needs to assess the valuation of the ecosystem at the national level and invest in the transition to a blue economy.<sup>72</sup>

## Conclusion

In this paper the characteristics of the Sino-U.S. power plays, Southeast Asian inter / intra connectivity and its effects on the ASEAN states have been analyzed in depth. Special focus has been given to the balancing strategy required in such an environment.

An endeavour has been made to craft a relevant Way Forward for Bangladesh in the prevailing regional setting. Suffice to say that regional

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70 Constantino Xavier February 2018, 'Bridging Bay of Bengal: Toward a Stronger BIMSTEC', Carnegie India [online], June 2018. <<https://carnegieindia.org/2018/02/22/bridging-bay-of-bengal-toward-stronger-bimstec-pub-75610>>

71 Manik Shaikh RezanulHaque February 2018, 'Blue Economy: A New Prospect for Bangladesh', Daily Sun [online], June 2018. <<http://www.daily-sun.com/printversion/details/290283/Blue-Economy-A-New-Prospect-for-Bangladesh>>

72 Patil Pawan April 2018, 'Bangladesh is thinking big by thinking blue', World Bank [online], June 2018. <<http://blogs.worldbank.org/endpovertyinsouthasia/bangladesh-thinking-big-thinking-blue>>

partnership in and around the Bay of Bengal is expected to give desired dividends in all spheres, especially in economic and infrastructural development of Bangladesh. While every sovereign state has its own right to choose whatever is strategically prudent in a prevailing geo-economic environment, but maintaining an apt balance in relations with the trio (USA-China-ASEAN) emanates as the most logical course of action in present circumstances. The core finding of this paper can be summed up as follows:

“The potential role that Bangladesh can play in the region (South and South East Asia) is directly related to the strategic significance of the Bay of Bengal: its inter / intra operability in / around the region and its exploitation of natural resources”.

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## **Author**

Brigadier Imran was commissioned in an Armour Regiment in September 1990. The officer has served on the faculty of Pakistan Military Academy, Kakul (as Platoon Commander and Parade Adjutant) and as Directing Staff at Command & Staff College, Quetta. He has held numerous staff assignments, which include General Staff Officer - Grade III (Operations) of an Infantry Division, Brigade Major of an Infantry as well as an Armoured Brigade and Colonel Staff of an Infantry Division. He commanded his parent Armour Regiment, besides commanding an Armoured Brigade. He is a graduate from Command & Staff College, Quetta, National Defence University, Islamabad and an Alumnus of Harvard Kennedy School (Executive Education Program), USA. The officer during UN peace keeping mission in Somalia (1993-1995), participated in US Rangers Rescue Operation (Operation Gothic Serpent) in October 1993. In recognition of his gallantry performance, the officer was awarded Tamgha-e-Jurrat.

# **EMERGENCE OF ARTIFICIAL INTELLIGENCE IN FUTURE WARFARE: PREPAREDNESS OF BANGLADESH ARMED FORCES**

**Lieutenant Colonel Nizam Uddin Ahmed, afwc, psc,  
Engineers**

## **Introduction**

History of Humanity and Evolution of Technology is analogous to each other. Use of stone as a tool back in 10 million years ago initiated the human's instinct to use technology. With the passage of time, relationship of human with technology is getting new natural and intuitive interface. There is a trend of making digital relationship where Artificial Intelligence (AI) has unlocked new unbound opportunities. Machine Learning, Deep Learning, Natural Language Processing, Computer Vision, Intelligent Automation and Neural Network have created a different virtual world of knowledge based on intelligence which can be compared to human intelligence. The advent of Siri by Apple, Tesla's autopilot, Waymo by Google, Netflix, Pandora, Amazon Search, Flying Drones all have unleashed an inevitable AI Technology era. Google's self-driving car project has announced the arrival of autonomous machine age in this world. This is an extraordinary moment of time when machines can take the decision to act by itself while taking input data from its environment. Therefore, it is evident that human and machines will take part in future warfare where machines will be employed more autonomously. The advent of new technology always has changed the characteristics of warfare. With no exception, emergence of AI will also dramatically change the nature and laws of warfare so far human has experienced. With all the AI development projects taken by the developed and developing militaries, it is time for Bangladesh (BD) also to take adequate measures to make herself capable of dealing with such techno hype future warfare.

## Evolution of AI Technology, Future Trend and Various AI Applications

### Evolution and History of AI

The concept of AI can be traced back to 100 years ago when Czech writer Karel Capek published “Rossum Universal Robot” in 1920 where the concept of robot and its way of working were perceived<sup>1</sup>. Without developing the proper programming framework, AI was used in World War II in the field of cryptography and ballistic firing table of artillery<sup>2</sup>. The development came through the theory of computation by Alan Turing- an English computer scientist who invented the turning machine to calculate the logic of algorithm to build an electronic brain. This has acted as the foundation of AI thinking.

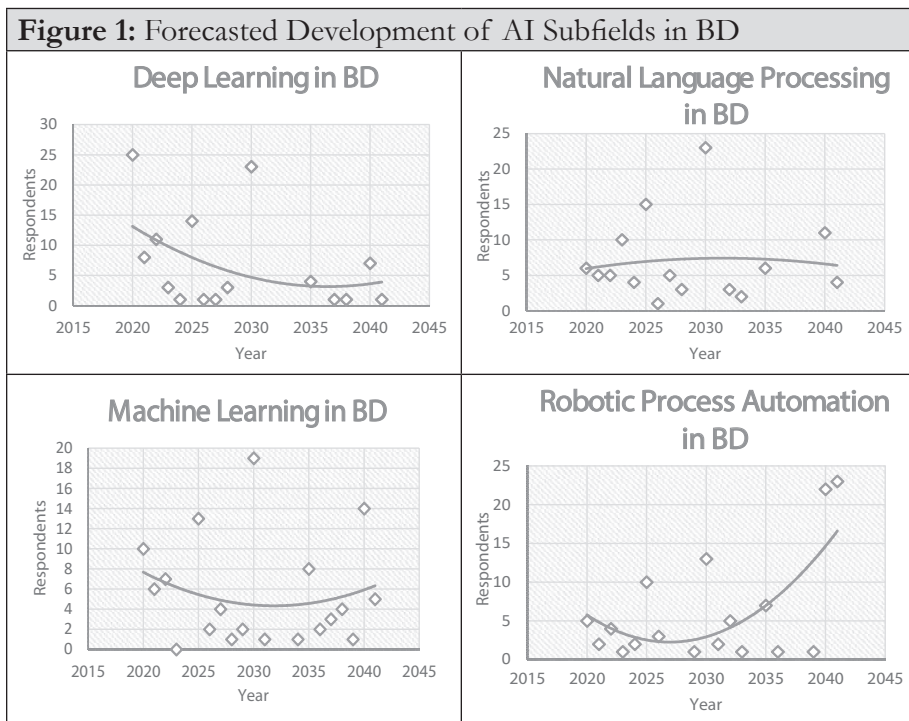
- **The First AI Spring** (1956-1974) marked the development the development of computational tools to act like human to solve geometrical problems, algebraic equations and checkers games.
- **The First AI Winter** (1975-1980) prevailed a short span of time when application of AI algorithms were supported by the limited processor speed and memory capacity of hardware.
- **The Second AI Spring** (1980-1987) emerged as the revival of AI by introducing rule-based programs which could emulate human intelligence for a decision making cycle.
- **The Second AI Winter** (1987-1993) witnessed a collapse as the inception of the economical desktop computers from IBM and Apple challenged the AI-functioned one.
- **The Third AI Spring** (1993-2011) was the boom of the AI application as followed by tremendous advancement in nanotechnology and micro-processor in hardware industries.

1. Capek, K., 1920. Rossum Universal Robot. s.l.:s.n.

2. Tim Sweijs, S. D. S. M. M., 2017. Artificial Intelligence and The Future of Defense. Hague: The Hague Centre for Strategic Studies.

## Trend of AI Development and Future Time Line

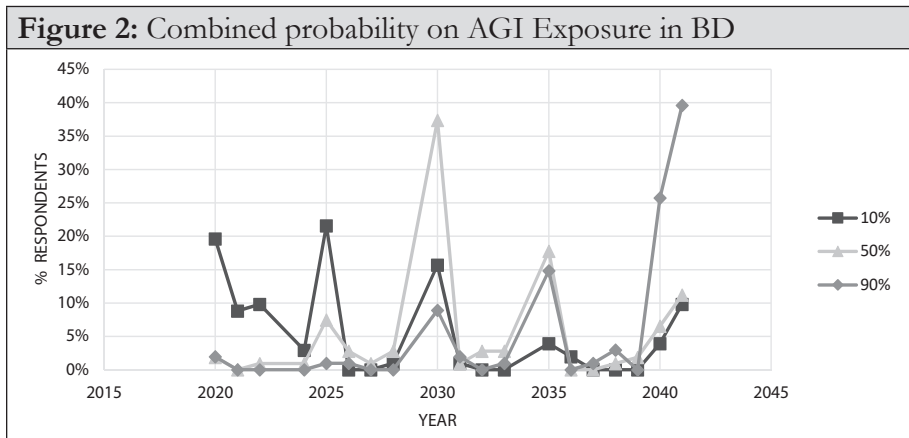
The 3rd AI Spring was finished on 2011 where 3rd AI winter started. After expected finishing of the winter in 2017 with six year duration, it is the 4th AI Spring which is likely to be started from 2018 and tends to prevail 18 years up to 2036. The 4th AI Spring (2018-2036) will be the new phase where predictive algorithm may have seen its pinnacle of development. The respondents of survey group (UGS) who were undergraduate students of computer science and engineering, have made a prediction about the Forester AI subfields exploration<sup>3</sup>. According to them, the time line of exploration of these AI subfields will likely to be extended for BD which they have predicted from 2020 to 2041. The forecasted diagram of various AI subfield exploration in BD are shown in figure 1.



3. Curran, R., Purcell, B. & Kisker, H., 2017. TechRadar: Artificial Intelligence Technologies, Q1 2017, s.l.: s.n.

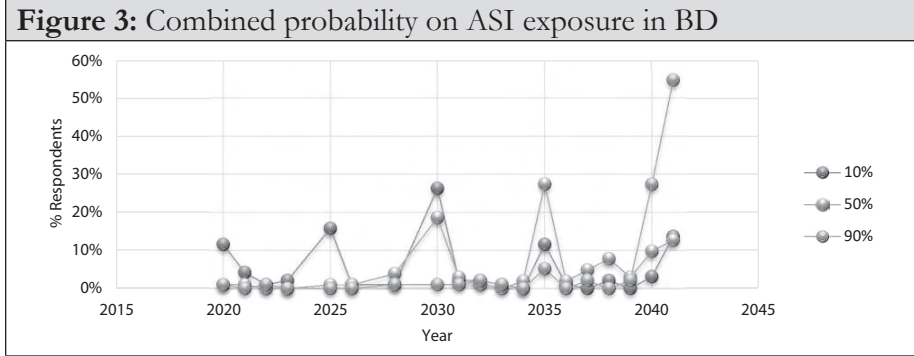
## Extent of Autonomy in AI

Development of autonomy in AI depends on progress of three categories of AI as ANI, AGI and ASI. The AI technology in present 4th AI spring experiencing the full potential of ANI. Most of the military hardware and weapon platforms across the world have been fully utilizing ANI technology. But the progress of increasing computational power of hardware is paving its ways for AGI. According to Moore’s law, the computing power is doubled in each two year in the world. Christopher Moore (2011) showed that the rate of computation capacity of hardware would reach as like as human by 2030 and cross sum of all human capacity by 2050<sup>4</sup>. Bostrom et al (2014) have predicted a possible development of timeline of human-level machine intelligence (HLMI) where he predicted that there was 50% probability that we would witness AGI by 2040<sup>5</sup>. With the prediction by Moore and Bostrom, respondents of survey group (UGS) also predicted the timeline of AGI and ASI which is shown in figure 2 and 3.

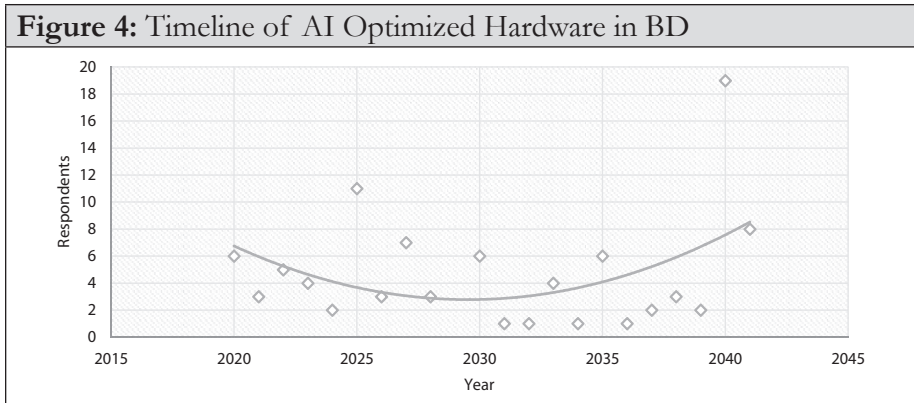


4. Moore, C. & Mertens, S., 2011. *The Nature of Computation*. s.l.:Oxford.

5. Bostrom, N. & Muller, V. C., 2014. *Future Progree in Artificial Intelligence:A Survey of Expert Opinions*. Springer.



Therefore, by combining Moore, Bostrom & Muller and respondent’s prediction, there will be 50% probability that AGI exposure will be the key factor in the world technology as well as in BD from 2030 to 2040. Military advancement in technology is most likely to follow the general trend line of AGI. But, exploration of AGI will need AI optimized hardware development. The respondents of survey group (UGS) predicted that BD will lack self-developed AI optimized hardware by 2030. Hardware development will experience an upward turn from 2030 to 2041. Therefore, AI exploration by military and commercial by 2030 will have to depend on the acquisition of AI optimized hardware from foreign countries which is evident from figure 4.



## Various AI Driven Branches and Subsets

To cope up with the imminent AGI technology by 2030, military advancement in technology will have to go hand in hand with commercial AI exploration. After considering the present progress of AI in the field of science and engineering, the standing committee of the one hundred year study of AI in 2014 suggested the future AI exploration area. These AI application area will have their individual parameters and characteristics which will expedite many military technology, weapon platforms and applications<sup>6</sup>. From these, the AI applications which can be utilized in various military applications are summarized as following:

- Machine Learning (ML) through which statistical data of battlefields and intelligence will be fed into computers to take informed decisions as like human. This learning will be improved through form of observations and real times inter action with world by autonomously.
- Deep Learning (DL) is a part of ML which is used for object image recognition, automatic speech recognition, activity recognition, natural language processing and audio perception. These are used by taking sensor signal and convert it to recognizable patterns.
- Reinforcement Learning (RL) is a subfield of ML which runs the decision making cycle to arrive at the best possible actions under any environment taking data from the sensors. It is a problem solving autonomous interface system which takes the feedback of its action and adjust its logical computation program for future action.
- Computer Vision (CV) is an AI application which uses the ML algorithm, to classify, identify and divide any object so that it can convert images to edges, gradients and three- dimensional shapes. Conversion of images to date is done by image processing and cognitive science.
- Natural Language Processing (NLP) is the science of understanding of human language by analyzing, understanding and deducing meaning

6. Horvitz, E. et al., 2014. Artificial Intelligence and Life in 2030. s.l.:Stanford University.



for action in an autonomous way. This voice interactive technology uses various language processing algorithm to convert human command to machine language which is used in RL.

- Crowd Sourcing and Human Computation (CSHC) are the branch of AI where problems are solved by computer and human together. The input data of battlefield are fed into the system where the processing of data to the best possible options are computed keeping human control by human-in-the-loop system.
- Collaborative System (CLS) is the model where human and machines can engage in a shared activity. This model closely functions with crowd sourcing to deal and monitor any situation taking input from all the sensors and surveillance devices for arriving at a common understanding through bringing out the most acceptable actions.
- Internet of Things (IoT) is a network system connecting all kinds of electronic devices which through the internet can efficiently exchange and share data in a broad database. It will allow centralized control of all the physical devices running from aircraft, ships, tanks, guns and other surveillance devices for direct integration in a common platform by which these can be monitored and controlled. It also integrates all the sensors to collect data for intelligence purposes.
- Robotics is the branch of AI where combination of various AI application are carried out in an interactive environments with people. It will use CV, NLP, ML and other form of machine perception to carry out parallel work done by soldiers in battlefield.
- Swarm Intelligence (SI) is the collective system of applications by self-organized agents who can perform a limited capacity but collectively completes a specific assignment. SI will be extensively used in swarm drones, submersible drones, intelligence gathering, and missile defense and enhanced communication.

## **Present Military AI Technology, Future Military AI Development and Trend of Military AI**

The large amount of data related to environment, terrain, people, demography and military capabilities can be managed in a more sophisticated and efficient way than today. The wide range of use of AI can be applied to surveillance, monitoring, cyber protection, cyber offensive capacity, information collection & processing, target selection & engagement, logistics & inventory management, healthcare technology, simulation & training, nuclear weapon control & protection, unmanned combat vehicles, intelligence collection, security and many more. For preparing the military by utilizing such techno hype, developed countries as USA, Russia, UK, Canada, France and emerging countries as China and India are heavily investing in military AI system. Military market of AI in 2016 was USD 5.54 Billion which is predicted to reach USD 18.82 Billion by 2025 having compound annual growth of 14.75% each year<sup>7</sup>.

## **Present Military AI Applications Used by Armed Forces of USA, China, India and Future AI Program**

USA is one of the pathfinder in the field of military AI who is not only rich in manufacturing AI technologies but also expert at the application of it with various military platforms. Their initial breakthrough in academic AI research have given them a clear leading role to both military and commercial AI industry. After the cold war era, shifting efforts from developing nuclear arsenal, USA has focused more on developing AI platforms to augment its military operation capacity and effectiveness in terms of unmanned aerial combat vehicles, surveillance system, stand-off weapon and force projection system. Some of the current military AI applications with future development program of USA have been discussed:

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7. marketsandmarkets.com, 2018. [www.marketsandmarkets.com](http://www.marketsandmarkets.com). [Online]

- Autonomous Deep Learning System (ADLS) will be used extensively in intelligence collection and large data interpretation. The ADLS is built on providing early warning from the conflict zones where fog of war clutters the decision making cycle.
- Human–Machine Collaboration (HMC) will prepare a team with the acumen of a human and tactical acuity of a computer to meet any threat with dual human-machine capacity. It will introduce a new form of warfare where dual intelligence of human and machine will be used at machine speed against the potential threats.
- Assisted Human Operations will enable soldiers to operate in the battlefield using wearable electronics, armored exoskeleton and electronic head-up displays. The soldiers can track the situation which are obstructed visually and also be tracked in high-risk operation to reduce his life risk.
- Advanced Human-Machine Combat Teaming emphasizes on human-machine collaboration where human are able to do cooperative operations with unmanned system. Electronic warfare network and swarming system will be used instead of individual Unmanned Aerial Vehicle (UAV) and Unmanned Underwater Vehicle (UUV) which require multiple operators.
- Network-Enabled Semi-Autonomous Weapons will allow protection of the entire system against cyber-attack by linking the devices under a broad network system and making it hardened for cyber security and enable to work under a centralized command to enhance synergy of various capabilities.
- Machine Learning Approach to Targeting allows to identify, track and engage targets under five broad groups as physical, functional, cognitive, environmental and temporal<sup>8</sup>. Through AI algorithm under cognitive learning system, future joint targeting system are being developed.

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8. Lewis, C., 2016. [www.warontherocks.com](http://www.warontherocks.com). [Online]

- Augmented Reality (AR) technology superimposes the virtual geo-tagging of object information over the real time object to alert soldiers about the current environment of the operational area. It will transform the battlefield with geo-tag, flows the information seamlessly and aids in taking instant decision under a catastrophic high risk situation<sup>9</sup>.

China is emerging as the next dominant leader in the AI domain when Chinese government has officially revealed its plan in 2017 to become world's pre-eminent practitioner of AI in both research and application by 2030 through creating an AI industry worth USD 150 Billion<sup>10</sup>. The plan includes three phases as keeping pace with AI technologies by 2020, achieving major breakthrough by 2025 and leading the world of AI by 2030<sup>11</sup>. Making AI focused education as the cornerstone of Chinese national strategy, Peoples Liberation Army (PLA) is preparing a military-civil fusion to take full potential of private sector progress in AI technology to exploit its military capabilities. Few important AI applications of Chinese Armed Forces are discussed:

- Quantum Technology (QT) will enable to make better sensors for greater situational awareness to reduce the ambiguity in the grey zone of battle space. It will enable to track aircraft, to crack encrypted signal codes by developing sophisticated equipment and weapon based QT<sup>12</sup>.
- Battlefield Singularity is being developed to cope up with the operational tempo of machine-age warfare. Keeping human out of the loop, it aims at developing fully autonomous decision making system using deep learning at machine speed to support the human cognition and decision making cycle in the battlefield.
- Intelligentized is the AI system which uses neural network through supervised learning from human experts and reinforcement learning from operating battlefield environment. The 'value networks' evaluate

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9. Bevond, 2015. <http://bevond.com>. [Online]

10. Williams, G., 2018. [www.wired.co.uk](http://www.wired.co.uk). [Online]

11. Lee, A., 2017. [www.scmp.com](http://www.scmp.com). [Online]

12. Blair, A., 2018. [www.dailystar.co.uk](http://www.dailystar.co.uk). [Online]

the brand courses of action and ‘policy network’ will finalize specific course of action<sup>13</sup>.

- Intelligent Unmanned Systems will develop unmanned platform for operating in both air and water. Introducing UAV swarming, it will explore the role intelligentized command and control (C2) in a joint environment of warfare<sup>14</sup>.
- Semi-Autonomous Missile System will develop missiles capable of connecting the way points autonomously, avoiding engagement by interceptions, optimizing strike location and achieving maximum lethality. The automated flight guidance and target recognition mechanism will enhance the operation versatility of the tactical and strategic missiles.

India has been considering AI as one of the critical ingredients of its national security strategy as well as for its commercial market. To envisage the future trend of military technology, Center for Artificial Intelligence and Robotics (CAIR) was set up in 1986 with Indian Institute of Information Technology (IIIT). The Defense Research and Development Organization (DRDO) has established CAIR as one of its apex laboratory where the emphasis is being provided on intelligent system, unmanned system, information security and net centric system for tactical common control & communication system<sup>15</sup>. Some of the recent military AI projects are discussed:

- AI Techniques for Network Centre Operations (ANCO) has been developed to carry out various dimension of network centric operations.
- Development of Surveillance and Reconnaissance application has been undertaken which is developing autonomous navigation system with visual outlook.

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13. Kania, E., 2017. [www.lawfareblog.com](http://www.lawfareblog.com). [Online]

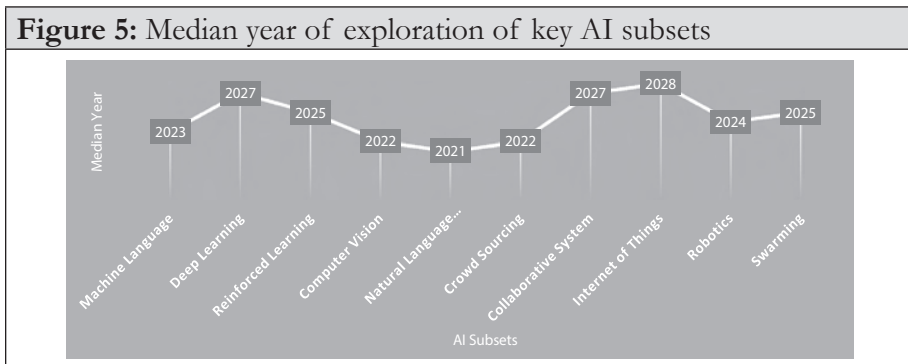
14. Spiegeleire, S. D., Maas, M. & Sweijs, T., 2017. *Artificial Intelligence and The Future of Defense*. 1st ed. Hague: The Hague Centre for Strategic Studies (HCSS).

15. DRDO, 2018. [www.drdo.gov.in](http://www.drdo.gov.in). [Online]

- Unmanned Ground Vehicle (UGV) is getting attention for carrying out low-intensity conflicts along with UAV and UUV.
- Voice Recognition System has been applied on the Network Traffic Analysis (NETRA) to monitor internet data transfer and uses.
- Multi Agent Robotics Framework (MARF) has been developing to bring out various miniature robots for employment in navies high-risk security situation along with dealing with handling of Improvised Explosive Devices (IED) and evacuation system for personnel.
- Image Interpretation has been getting more emphasis for identification of the various objects, living beings and preparations of image maps<sup>16</sup>.

## Concentration of Efforts of Military Hardware on AI Fields

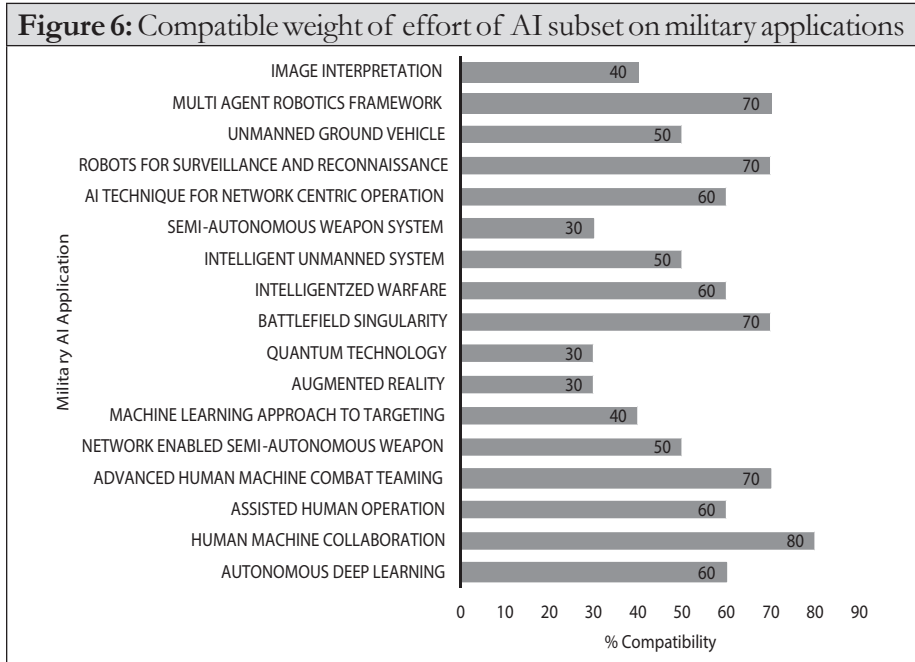
The development of AI has been carried out both by commercial and military institutions for varied purposes. Apparently they look incompatible to each other based on purposes but their exploration fields are complementary to each other. The time line of key AI subsets is shown in figure 5.



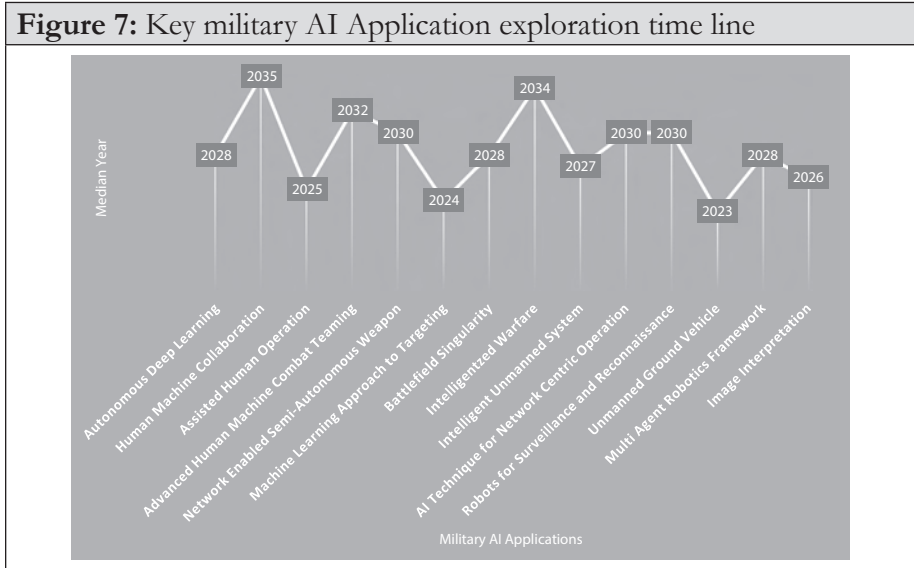
As these AI subsets will be the foundation programming of the various military AI applications, therefore the complementary role of these AI

16. Chakravorty, P., 2017. <http://www.indiandefencereview.com>. [Online] Available at: <http://www.indiandefencereview.com/news/artificial-intelligence-and-its-impact-on-the-indian-armed-forces/> [Accessed 19 7 2018].

subsets in current and future military AI applications have been predicted. The complimentary role of these AI subsets have been converted into compatible weight of effort of AI subsets and shown in figure 6.

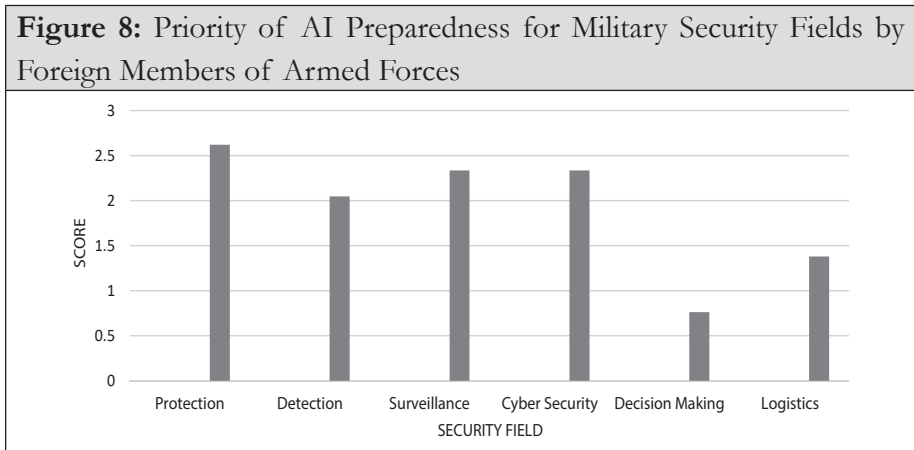


After analyzing the above figure, more than 40% weight of effort of AI subsets can be considered as having immediate attention of the scientist. These also tend to have maximum application chances and likely to be explored earlier. However, the time line of exploration is not known as there are no clear military steps taken to explore these fields independently. By studying the different time line of AI subsets and compatible military AI applications, a combined compatible time line of military AI applications in regards to AI subsets has been shown in figure 7.



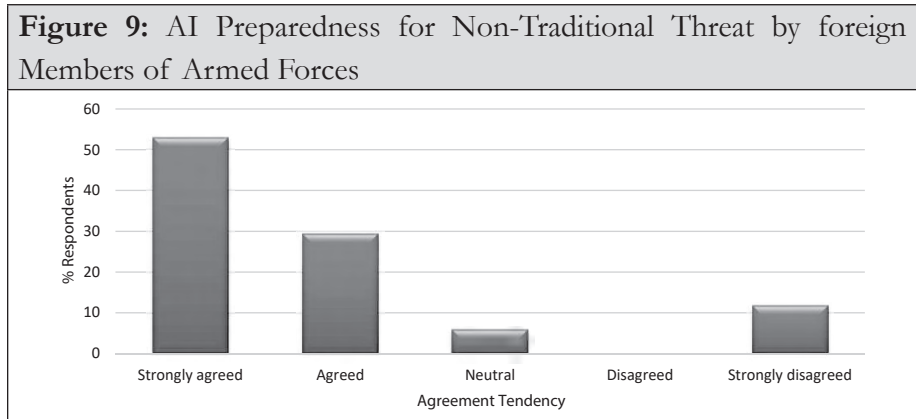
### AI Development Priority in Broad Security Fields

The respondents of survey group (Foreign) comprising foreign armed forces members have preferred protection, cyber security, surveillance and detection as their priority of future AI development for their armed forces. The relative priorities of AI development for military security fields are shown in figure 8.

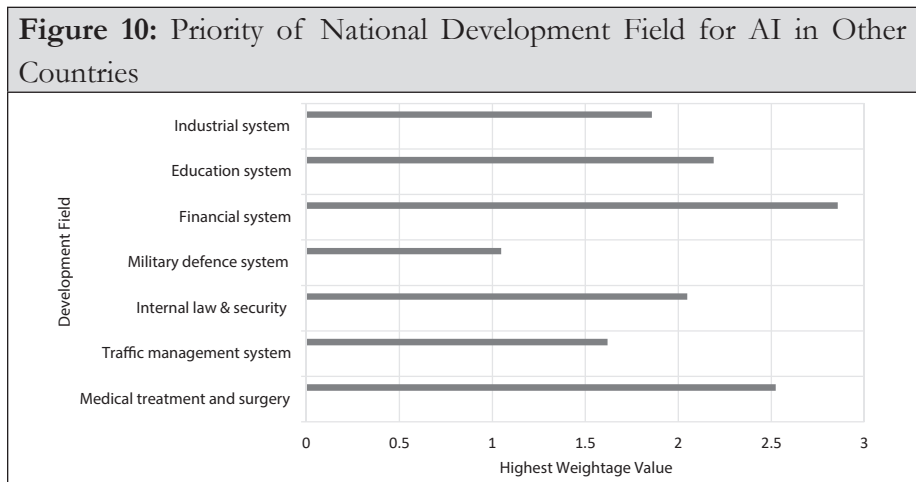




The likelihood of international terrorism using AI technology is much higher. More than 80% respondents of foreign armed forces members also showed higher concern about this non-traditional threat as shown in figure 9 and opined that their armed forces should also get ready to combat the AI threat posed by the terrorist groups.

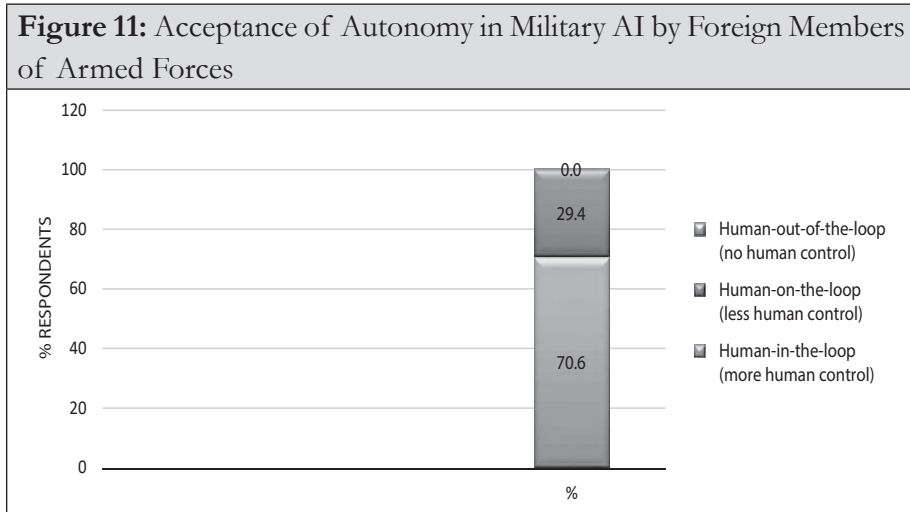


For prioritizing national field for AI, the respondents of foreign armed forces members preferred financial, medical, education and internal law & security sectors over military defence system. The preferences is shown in figure 10.



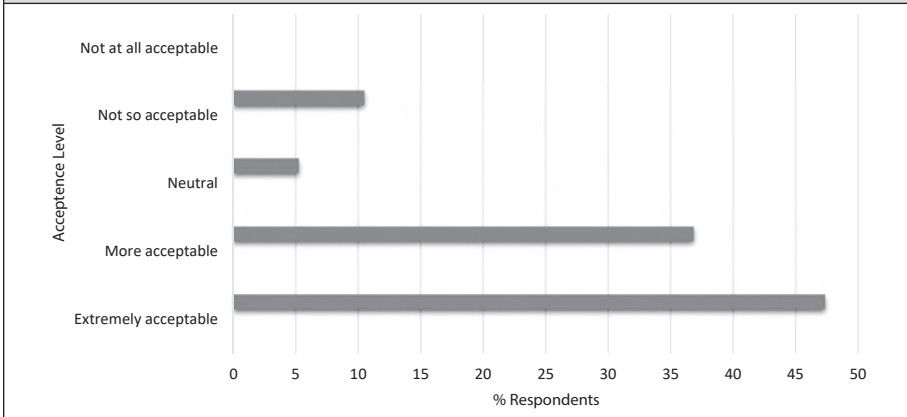
## Ethical Concern for Autonomy in Military AI

To understand the psyche towards autonomous lethal weapon, an ethical acceptance is needed across the members of the armed forces. Today's AI application in military mainly revolves through human-in-the-loop mechanism. Now, AI is driving military weapon technology towards AGI and ASI where the human control will be either in supervising role or having no control on machine. Therefore, human-on-the-loop and human-out-of-the-loop weapon technology are going to be the ultimate military application technology in future. But the general acceptance by respondents of foreign armed forces members towards human-in-the-loop still remains 70.6% which clearly indicates that the autonomy of military AI is not yet accepted by other members of armed forces. The preference is still with ANI. The responses is shown in figure 11.



With this psyche towards ANI, more than 84% respondents of survey group (Foreign) preferred ANI military technology in conflict situation with human-in-the-loop mechanism. The responses is shown in figure 12.

**Figure 12: Ethnical Acceptance of Military AI Technology by Foreign Members of Armed Forces**

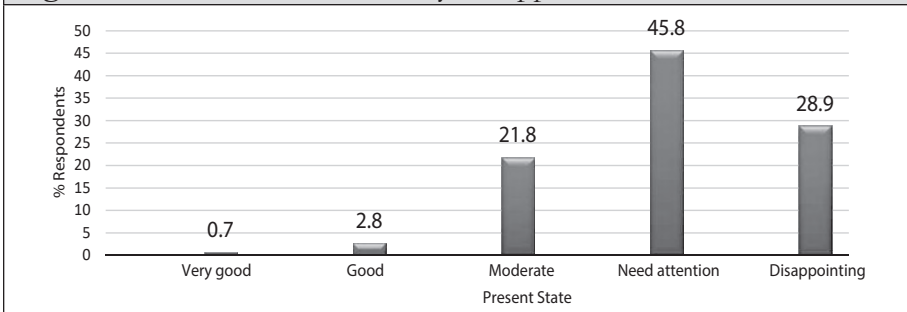


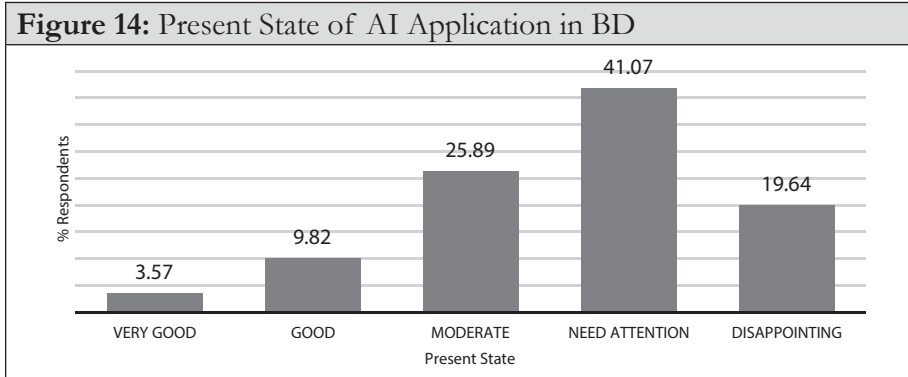
## Preparedness of Bangladesh Armed Forces For AI Technology

### Present State of AI Application in BD and BD Armed Forces

The general picture of present state of AI in BD Armed Forces has been reflected as disappointing and need attention as 74% respondent of survey group (Military) opined who were mid-level members of Bangladesh Armed Forces; whereas 60% respondents of survey group (UGS) reflected same status for BD as a whole. The reflection of their opinion is shown in figure 13 & 14.

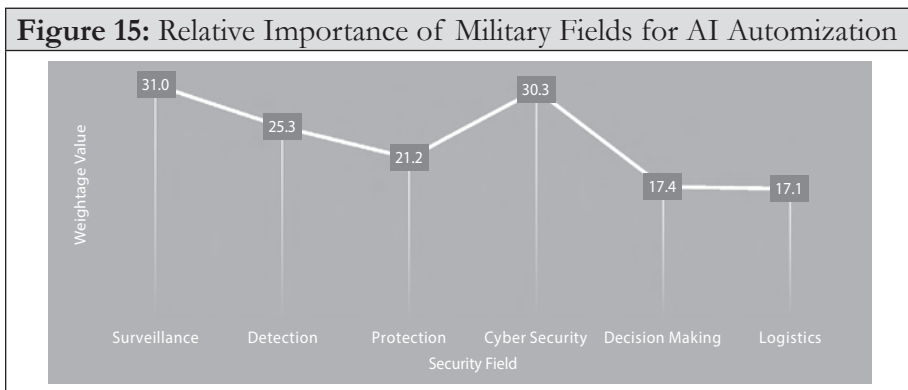
**Figure 13: Present State of Military AI Application in BD Armed Forces**





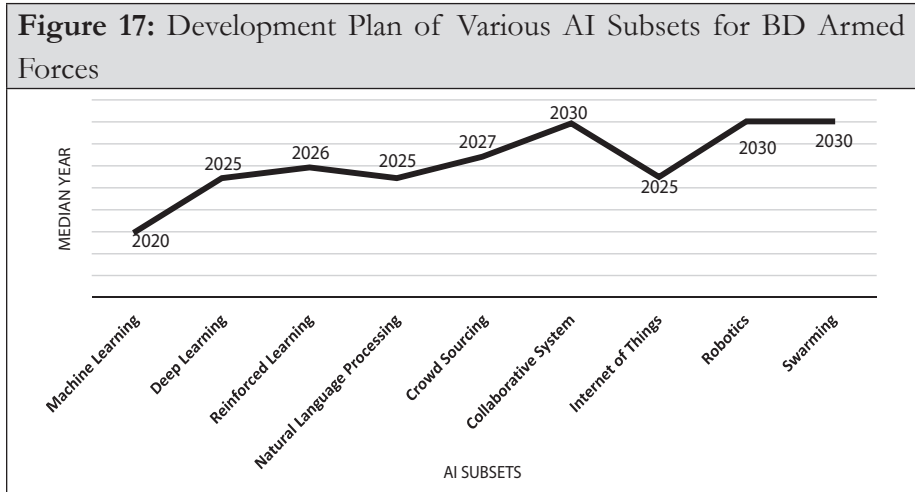
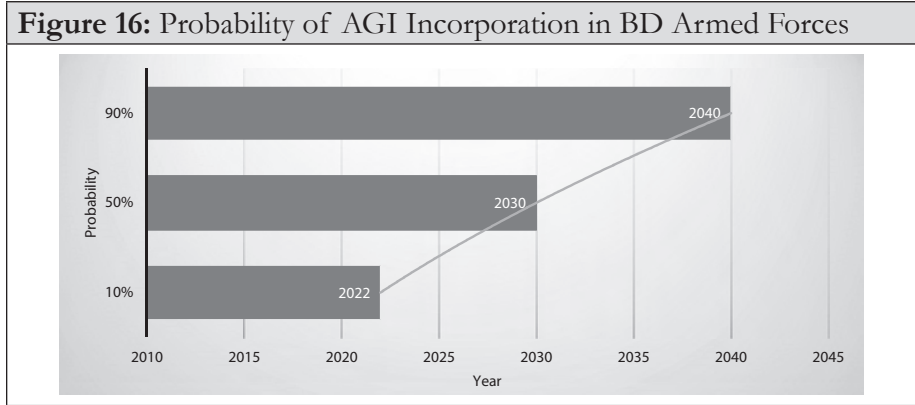
## AI Applications and Related AI Subsets for BD Armed Forces

As AI is a transformative military technology, to get maximum utilization by harnessing this game changer, there are six fields which has scope for automization with AI applications. To deal with the trend of future warfare, the military professionals of survey group (Military) have identified various military security fields which need to be safeguarded as shown in figure 15.



The development of AGI will take the lead role as most of the AI academic respondents of survey group (UGS) opined that there is a 50% probability of development of AGI by 2030 in BD which would have definite impact on the various dimensions of the military fields. Other types of probability of incorporating AGI in BD Armed Forces is shown in figure 16. The

combined development plan of various AI subsets for BD Armed Forces is also shown in figure 17.



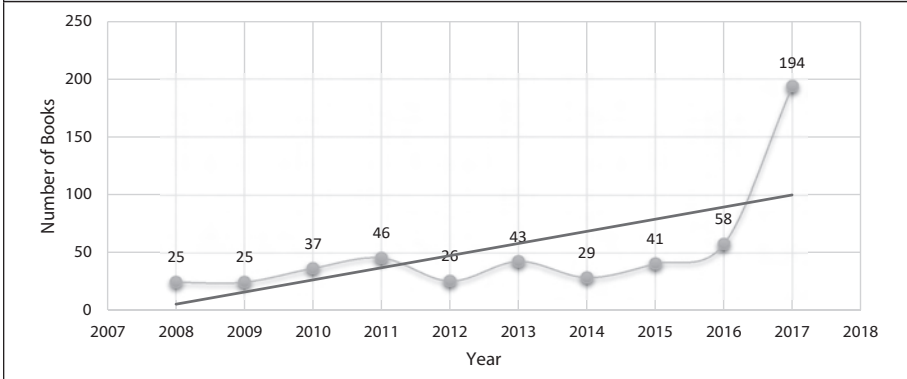
## Feasibility of R&D, Ethical Regulations and Road Map to AI for BD Armed Forces

### Feasibility of Military AI R&D for BD Armed Forces

- **AI R&D Capacity by BD Engineering Universities:** To understand the present capabilities of BD engineering universities and

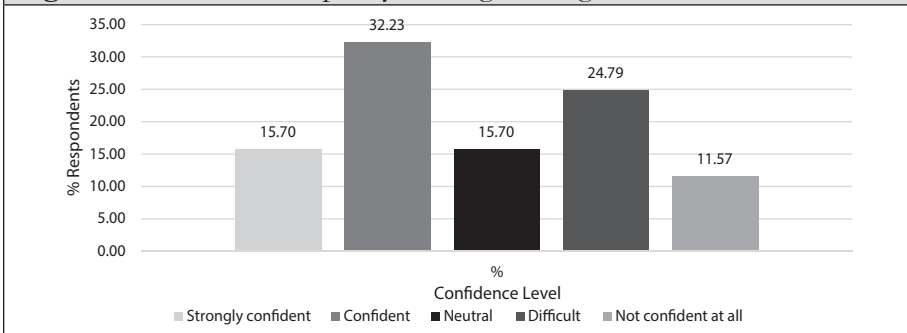
academicians to foster R&D of AI, the AI related publications have been sorted out. It is found that the volume of publications from BD is quite low compared to that of other countries. From 1996 to 2017, there are only 557 academic publications on AI from BD (SJR, 2018) holding 61st position globally. A comparison of 2017 AI publication with other countries are shown in figure 18<sup>17</sup>.

**Figure 18: AI Publication by BD From 2008-2017**



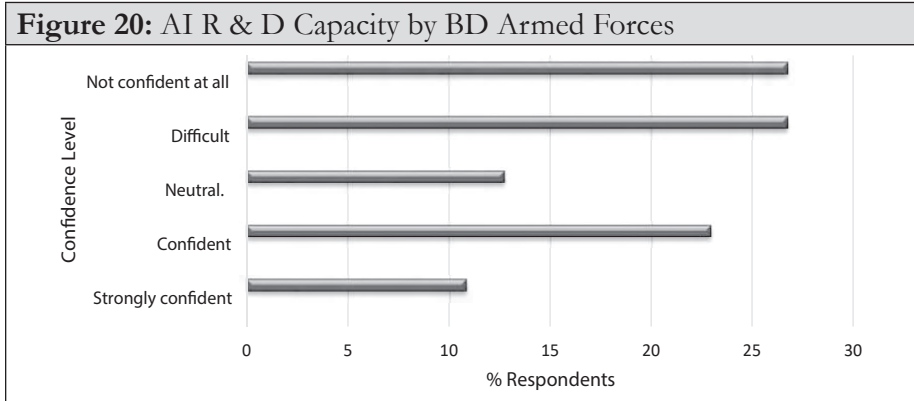
The confidence level of BD engineers in developing AI R&D as opined by the respondents is shown in figure 19.

**Figure 19: AI R & D Capacity of Engineering Universities of BD**

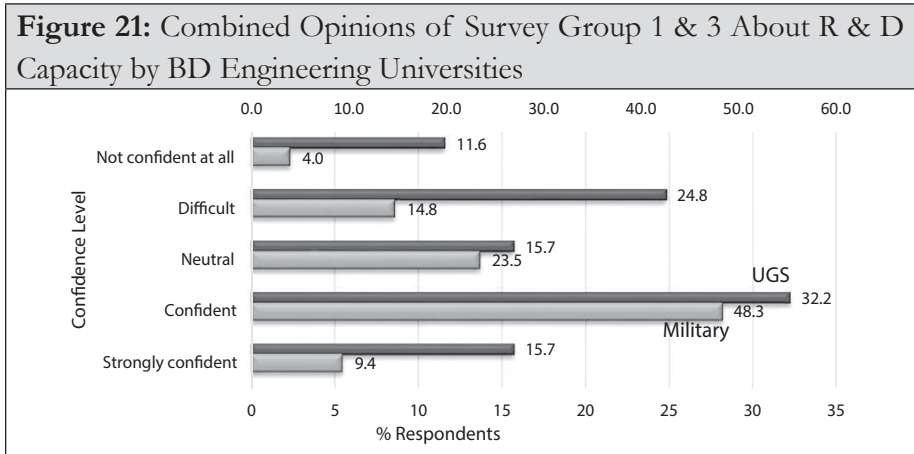


- **AI R&D Capacity by BD Armed Forces:** 53% respondents of survey group (Military) have opined that BD Armed Forces do not have right technical skilled people who can contribute in AI R&D. The opinion of the respondents is shown in figure 20.

17. SJR, 2018. [www.scimagojr.com](http://www.scimagojr.com). [Online]

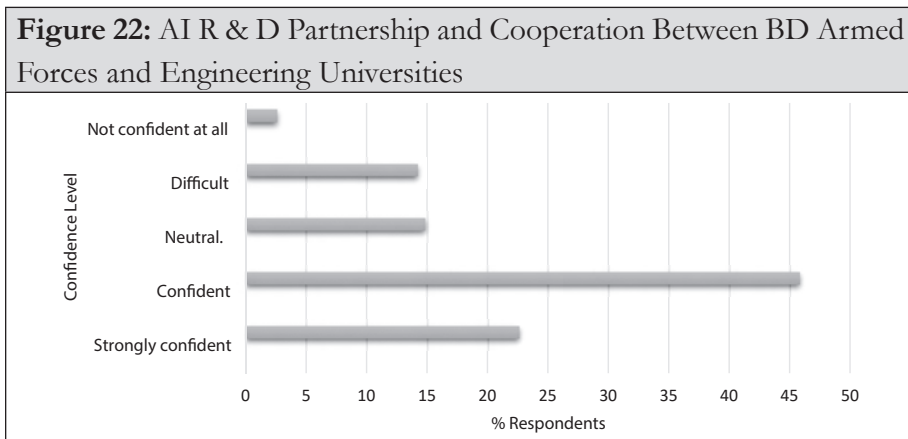


- But 58% respondents were confident that BD engineering universities have right technical skilled engineers who can contribute in the development of AI R&D if government makes scopes and sponsored it. The combined opinion of the respondents is shown in figure 21.



- **Options for AI R&D by BD Armed Forces:** Analyzing the combined opinions of both groups of respondents, it can be inferred that the difficulty level of military R&D can be overcome as the confidence level shows significant strength. Therefore, removing the difficulty in the confidence level of CSE undergraduate students, BD Armed Forces has its only option of utilizing them as the in-country professional for AI R&D with proper sponsorship and scholarship program. The most

prominent reason is that the intellectual level about AI knowledge is increasing as evident from the increasing AI research works and self-interest of the engineering students. Sufficient fund to conduct R&D, dedicated research work focusing AI algorithm for military applications, allotting more credit hours for AI in undergraduate level, harnessing robotics & AI club activities and nationwide awareness for AI will help removing the non-confident gesture of the AI engineers. A partnership and cooperative approach towards development of AI would make the AI R&D successful. 68 % respondents of survey group (Military) are confident to establish an AI R&D between BD Armed Forces and local engineering universities. The response is shown in figure 22.

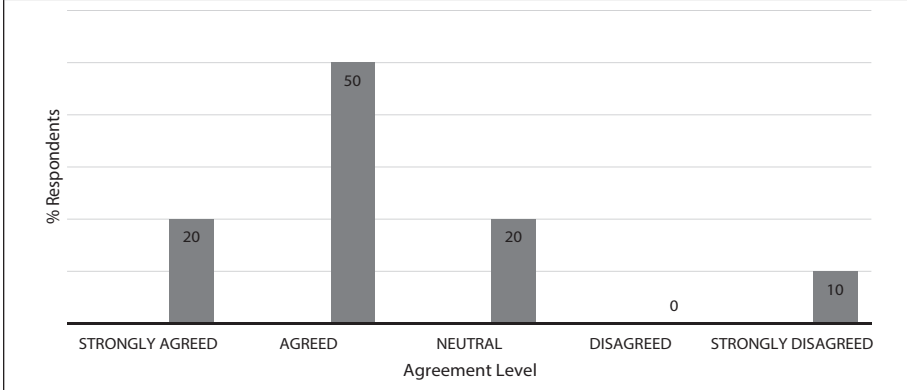


### Proposed AI R&D Strategy for BD Armed Forces

70% respondents of survey group (Military) emphasized that AI R&D should be a shared responsibility of government, military and stakeholders. The opinion is shown in figure 23.

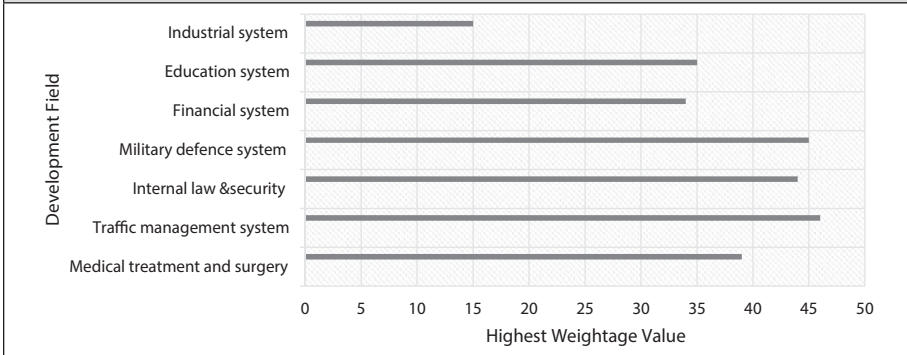


**Figure 23: AI R & D as Shared Responsibility with Government, Military and Stakeholders**



With this shared development of AI R&D, various national requirement in public sectors along with security issues can be brought under AI technology. The preferred priority is shown in figure 24.

**Figure 24: Priority of National Development Field For AI R & D**



The proposed AI R&D fundamentals can be summarized as following:

- Make Two-Fold AI research objectives which can deal with both military security and render social benefit by providing maximum value for the protection and services for the well-being of the people. These long-term sustained reward pay-off AI development need to be planned for mid and long term spanning 7 and 15 years respectively.

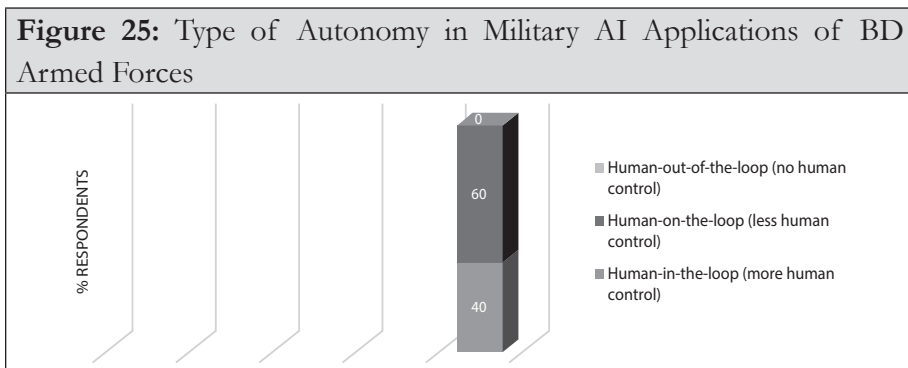
- Focus on Cognitive AI algorithm so that development of various AI subset programming languages for perception, sensing, thinking, acting and teaming can be developed.
- Establish AI enabled hardware industry in collaboration with the various AI techno giant commercial firms so that we can build our own foothold and maintain self-dependency in long run.
- Create effective interface between Human-AI Machine in such a way that AI application are made keeping human on the loop. This collaboration will allow sharing the workload, relieving human for more cognitive tasks and above all, holding the control of AI machine with human will allow averting undesirable occurrence and consequences.
- Address legal, ethical and fundamental principles for the use of AI application so that human value is put on highest priority by making the rules of engagement transparent and explicit in its application and accountability by design.
- Developing large datasets from interactive environments so that data of intelligence value can be stored and accessed. These data feed will have to be carried out by various sensors, visual processing equipment, air platforms, naval platforms and satellites. Methods have to be experimented for smooth access of these data by various military platforms after duly analyzed by deep learning methods.
- Decision making process algorithm following Gartner analytics maturity model can be developed. The descriptive diagnostic, predictive and prescriptive sequences should be developed to help facilitating the decision making process.

## **Suggested Ethical Regulations Guidelines for AI**

Keeping the ethical issues, acceptance level of working with machine and using machines autonomously, following ethical guidelines can be suggested:

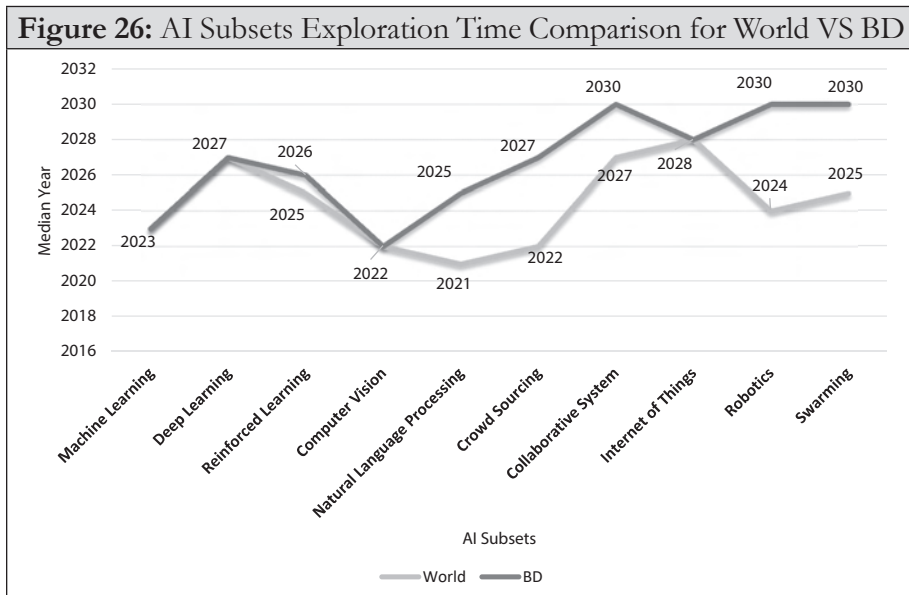
- An appropriate level of human judgment has to be instilled in all the military AI algorithm.
- Distinguish characteristics between a civilian, insurgent, terrorist and opponent military need to be ensured.
- Enforcing accountability and holding responsibility to the appropriate authority in case of fatalities by autonomous use by AI machine due to failure of identification and recognition of target.
- Asimov's ethical rules for robot behavior need to be followed in designing military AI algorithms.
- There has to be a balance between obeying, surviving and protection choices made by military AI application.
- Data access must protect the privacy of people of the society unless it is proved harmful to the state.
- Data protection framework with self-regulation has to be established in all the stakeholders involved in AI R&D.

In case of allowing extent of autonomy in USV and UAV, 60% respondents of survey group who were members at policy and decision level accepted human-on-the-loop AGI having less human control on the machine and allowing it to work more autonomously. The responses is shown in figure 25.

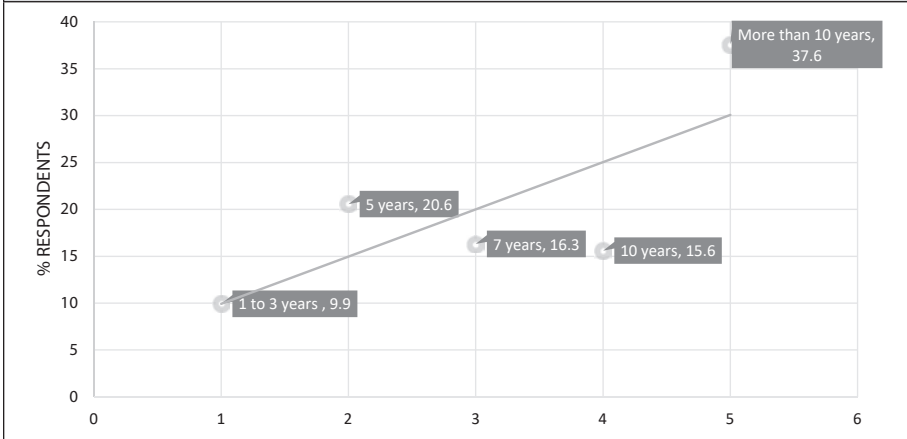


## Suggested Road Map for Military AI Capabilities

The road map for attaining military AI capabilities has been designed based on exploration of AI subsets, policy formulation, partnership arrangement, developing applications for prioritized military security fields, assembling AI compatible hardware, formulating R&D cell, accumulating technical workforce, awareness program, educating service members, data sharing, communicating and connecting stakeholders under a common platform. To do so, a 12-year-road-map has been suggested where target year for AI subsets was decided on the exploration year of AI subsets in world’s technological forum which would be pursued in BD. The timings are shown in figure 26. These time line will be followed under various security field where related military AI applications can be developed. Within these time frame, other support infrastructure and regulatory issues have been arranged in terms of their relative necessity of formulation. The concerned stakeholders are mentioned responsible under specific task head under its own time frame. The timeline for Road map has been agreed upon by the respondents of survey group (Military) as more than 10 years. The opinions are shown in figure 27.

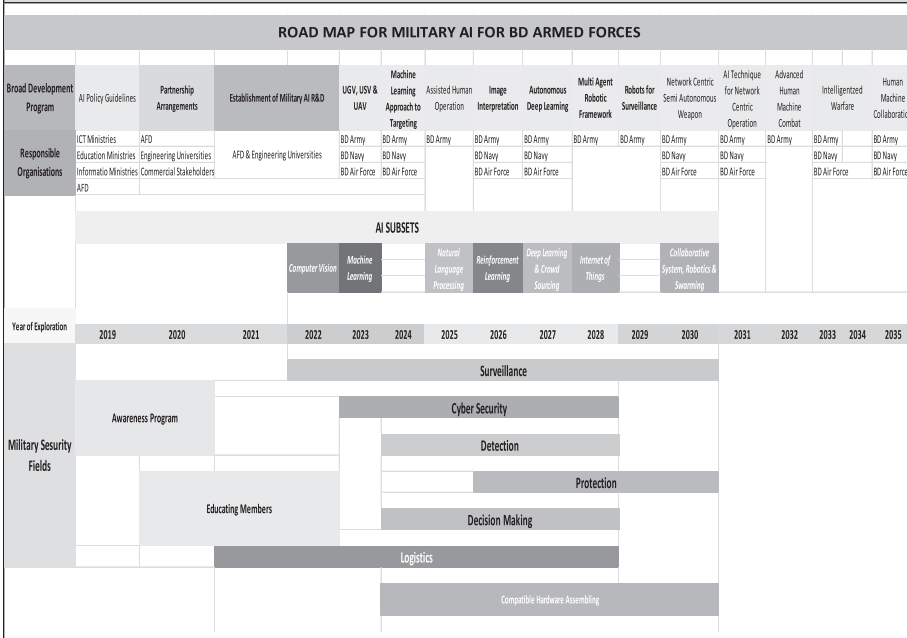


**Figure 27: AI Road Map Formulation Time Line**



## Proposed Road Map Architecture

**Figure 28: Proposed Road Map for BD Armed Forces**



## Recommendations

With the above discussion on various factors of AI development for BD Armed Forces, following recommendations are made:

- A shared national AI R&D center can be established under joint coordination and partnership with BD Armed Forces with civil engineering universities to explore the AI subsets algorithms for both social and security applications. Leading techno giants may be invited for co-production of AI compatible hardware in BD.
- National AI policies covering the ethical issues, development objectives and usage fundamentals of autonomy can be developed and implemented through ICT ministry.
- Knowledge awareness program among members of BD Armed Forces can be taken with a view to informing how AI can be used.
- AFD can integrate the future development program of three services keeping compatibility with AGI technology.
- Efforts need to be taken by three services and law enforcing agencies for allowing access and use of data to build a common intelligence database which can be maintained by AFD.
- A 12-year road map to AGI technology can be implemented by assigning responsibilities to concerned stakeholders for development of key AI subsets and cognitive AI algorithms with human-on-the-loop control system.

## Conclusion

The military AI applications pursued by various countries are the result of their long term planning and research efforts for obtaining capacities to meet the challenges posed by the AI technological inevitability. The future war will be fought with the dominance of information rather than indiscriminate use of lethal weapon. The use of munitions would be the

last resort which would also demanding precise data location. The decision maker would be facilitated through 4-dimensional data interpretation by the AGI technology. Thereby, AGI will soon appear as controlling such interpretation, eases and broadens the scope of its application. The human-machine interface will soon bring the humanity in a complex and compound scenario where dependency and supremacy should be retained by human causing machine to facilitate only. AGI will cause scopes to spare human for more cognitive work for which we are meant to. BD Armed Forces must take every endeavor to explore and emphasize our human intelligence capacities for the development of key AI subsets by infusing civil-military expertise. BD has the intellectuals' leaders who are contributing various leading research projects around the globe. It's time to reconcile and reemerge our intellectual strength to prepare the defense forces by the concerted efforts by all the stakeholders. Such a drive will open the unexplored opportunities not only for military but also for the people of the country.

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# **EFFECTS OF SOCIO ECONOMIC CHANGES ON FINDING QUALITY INTAKE OF OFFICERS FOR BANGLADESH ARMY: AN ANALYSIS AND WAYS AHEAD**

**Lieutenant Colonel Azaher Uddin Ahammed, afwc, psc, Inf**

## **Introduction**

Bangladesh Army is a reputed organization both at home and abroad. The organization since her inception has displayed a remarkable professionalism in all the fields of her employment. As a result, Bangladesh Army has emerged today as the symbol of trust and confidence to the nation. It is believed that the ‘Corps of Officers’ of Bangladesh Army being the main driving force of the organization has played the vital role in the organizational accomplishments as the efficiency of the organization has largely depended on the standard of its officers.

Bangladesh Army traditionally received an excellent set of officers in past who proved their excellence in all possible assignments. This was possible as the organization usually received a good number of quality candidates in the officers’ selection inlet. It is believed that, finding such quality candidates was relatively easier before, as the young generation had high attraction for this challenging profession. But recently, especially in last decade the downward trend in ‘quality intake of officers’ has increasingly become a concern in Bangladesh Army, where many related to this organization believe that there is a downward trend in the quality of officers’ intake.

It is believed that, Bangladesh recently has experienced significant changes in socio-economic areas, which caused massive expansion in the job market and resulted in diversified career opportunities. The public and private education system has excelled, corporate job opportunities have boomed,

self-entrepreneurial and business opportunities have increased, and non-military government jobs have gained faster pace. These changes together have created additional job opportunities for young people, especially to 'quality' ones. They have now much wider options and opportunities to choose their future profession. In this situation, the believed changes in the job and career opportunities lead to the apprehension that, 'the profession' of 'army officer' is probably losing its relative attraction to quality candidates due to the changed socio economic condition in Bangladesh. Once a coveted profession now probably is no more a desired destination to quality young people. As such, it is important to see whether the recent socio economic changes in Bangladesh have negatively influenced the interest of 'quality candidates' to join Bangladesh Army as officers and thereby caused the downward trend in quality of officers intake due to the reduced flow in the selection inlet.

## **Officer Selection Process in Bangladesh Army and Parameters of 'Quality Candidates'**

**Selection Process in General:** Bangladesh Army follows a long but comprehensive system for officer selection. The applications are invited by Army Headquarters Personnel Administration (PA) Directorate. Applicants then appear preliminary selection test where an initial medical test and 'Viva' is conducted. Candidates selected in preliminary selection test appear written test and qualified candidates then appear in Inter Services Selection Board (ISSB). Candidates selected from ISSB finally go through the final medical tests and get final selection to join Bangladesh Military Academy.

**Quality Candidates:** The ISSB is the only organization of the country of its nature. The officer selection process in ISSB fully recognizes the necessity of evaluating a candidate from physio-psychological point of view and carries out a set of comprehensive, detail and scientific tests to select the potential officers – the officer cadets. Considering everything, the institution decides either a selection or rejection. It is very difficult

to outline a correct definition of quality candidates. However, these are the mix of certain personality and leadership traits that are likely to make a candidate a functional officer. Quality of candidates are determined considering few personality and leadership traits, IQ etcetera. Though Socio Economic Status (SES) of candidates itself is not a trait or profile quality, yet considering it as one of the strong influencing factors to personality, is thought to be an indication to quality.

**‘SES’ and ‘Quality Candidate’ Relationship:** SES if individual is a complex phenomenon that significantly influences his/personality. This philosophical concept is strongly supported by the various behavioral theories mentioned above and supported by observations by number of scientists. There could be variations and exceptions, but in general, the influence of SES in individual’s PQ development is considered to be high. The SES being the only recordable parameter and strong influencing factor to personality and trait development, may be considered as the one of the indicators to quality. The origin of personality where SES is related to personality can be shown through following equation:

$$\text{Personality} = \text{Heredity} \times \text{Environment} \times \text{Time}^1$$

**Defining Different SES:** Considering the existing socio-economic condition of the country, candidates appearing before selection system are categorized in 5 SES, namely ‘High’, ‘Upper Middle’, ‘Middle’, ‘Lower Middle’ and ‘Humble’ class.

## Findings from Selection Data Analysis

### Selection from Different SES (2013-2018)

The study analyzed the total ISSB appearance and selection data from different SES for last 6 years (9 Regular Courses, 72 BMA LC – 80 BMA LC). The year wise SES based selection data shows that the selection percentage has significant relationship with the SES of candidates, though SES itself is

1 Hurlock, E. B., 1953. Developmental Psychology: A lifespan Approach. 1sted. New Tata Mcgraw Hill Companies

not a trait itself. The selection percentage is higher from in the candidates from higher SES. This indicates that finding more number of candidates from relatively higher SES is likely to make the average intake quality better.

## **Recent Socio Economic Changes in Bangladesh and Its Impacts on the Career Opportunities of Potential Candidates**

**Recent Economic Changes in Bangladesh:** The market-based economy of Bangladesh is the 43rd largest in the world in nominal terms, and 30th largest by purchasing power parity (Wikipedia, 2017). According to the IMF, Bangladesh's economy is the second fastest growing major economy of 2016, with a rate of 7.1%. Bangladesh is classified among the 'Next Eleven' emerging market economies. The economy of Bangladesh has reached a sustained growth with strong macroeconomic fundamentals. The satisfactory growth of import-export trade, secular increasing trend in the flow of remittance and the favorable balance of the current account kept the external sector stable.

**Economic Development Indicators:** The analysis of certain economic indicators like GDP growth, Per Capita Income, Savings Index, Remittance and Foreign Currency Reserve, gradual reduction of Trade Deficit and increase of Grosse Net Income give a clear picture of recent economic development in Bangladesh<sup>2</sup>.

**Recent Social Changes in Bangladesh:** Bangladesh has been experiencing a significant economic growth and development in last few years. This development had definite impacts on our social system. Though the social condition or the standards of living are difficult to measure, but indicators of social development do exist. The Human Development Index (HDI) is considered to be one of the advanced metrics for this.

**HDI:** HDI considers life expectancy, education, and GDP. The HDI of Bangladesh in last decade shows a clear upward curve. In addition to HDI, few

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2 <https://www.bb.org.bd/econdata/wageremittance.php> Foreign Exchange Policy Department, and Accounts & Budgeting Department, Bangladesh Bank.

more indicators also indicate significant social development in Bangladesh in recent years. As per the wage rate index of BBS the nominal wage rate index stood at 5712 in FY2011-2012, which grew gradually to 12230 in FY 2017-2018. An analysis of last 8 years investment data reveals that, both public and private investments have accelerated in the country. Bangladesh also has seen a big rise of employment opportunity from FY 2011-12 to 2017-18<sup>3</sup>. The national consumption in both public and private sector has increased in Bangladesh. The aggregate national consumption increased from 8601 Billion BDT in 2011-12 to 15653 Billion BDT in 2017-18.

**Analysis:** Analyses of different economic and social indicators give a clear indication that Bangladesh has achieved a significant socio economic development in in the recent years. Though, the economic and social developments were not symmetrically distributed throughout the country, still an overall positive indication was very much visible. Thus, it can be deduced as a general statement that Bangladesh has achieved a significant social development in last ten years.

## **Impacts of Recent Socio Economic Changes on Career Opportunity in Bangladesh**

**Increased Opportunity for Higher Studies:** Quality students always have a desire to pursue higher studies. The recent socio economic changes have increased the opportunity for higher studies in the country and abroad.

**Increased and Wider Job Options:** Due to the recent socio economic development in Bangladesh, the job market has experienced massive expansion and diversification. There was a time, when attractive job sector used to mean only the government civil service and few limited private job. But recently private sector has changed the total concept of the job market. The local and multinational companies are offering even more financial and social benefit to the employees. Besides, the expansion of business sectors are attracting many young people to develop their career in business.

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3 Statistics, BBS, Statistical Pocket Book of 2017 - 2018, Dhaka: Bangladesh Bureau of Statistics

**Effects on Choice of Profession:** The rapid socio economic developments in Bangladesh has not only created wider educational/ career opportunities and job options for young generation, but also has significantly influenced potential candidates' mindset and choice of profession. People now have much wider and diversified options to choose their career from. Some of the preferred professions to young generation are:

- **Business:** Due to the expansion of economic activates, a huge potentials for business prevail in Bangladesh. Agriculture, industry and service related business with lot of variations is possible in the country. Heavy, medium or even small and cottage industries are now booming, which is further supplemented by self-entrepreneurship and many other petty businesses in the country.
- **Corporate Job:** Bangladesh now hosts a large number of multinational companies operating in the country. Beside local corporate houses offers lucrative opportunities to the young people. Due to higher financial reward and esteemed lifestyle so many young people especially from the higher class of the society are attracted.
- **Job Abroad:** There had been a time when job abroad for Bangladeshi people were very much limited to unskilled labor areas. But now the situation is changing rapidly where there are lots of opportunities even for the high end professionals. As a result a good number of young people are attracted for the overseas employment.
- **Civil Government Officer:** With the emancipation of socio economic boom in the country, government machineries are expanded significantly and so with the employment opportunities.
- **Military Officers:** Military profession in Bangladesh had an esteem place in the job market. However, with the emergence of so many new opportunities, the attraction seem to fading, especially to the higher and more educated class of the society who actually have so many other attractive options.

- **Teaching:** Teaching remains a noble and prestigious profession in Bangladesh. Due to the private sector development in teaching related field, the opportunities have increased significantly.
- **Engineering:** Engineering was a lucrative target for young people in choosing their future professions. With the rapid development in the industrial fields, the opportunities have further increased.
- **Doctors:** In Bangladesh, Doctor as profession is a significant area. Government has taken to many programmers to take the health care to every citizen. The employment opportunities thus in this field are huge and attractive.
- **Self Employment:** Beside the aforementioned major areas of employment, Bangladesh possesses so many other job opportunities including self-employment.

## **Attraction to the Profession ‘Army Officer’ and Ways to Improve**

**General.** In the growing concern of reduced interest of quality candidates to join Bangladesh Army in the changed socio economic condition, it is utterly important to understand the present mindset of potential candidates/ guardians. As such Bangladesh Army Headquarters Personnel Administration (PA) Directorate data of number of initial applicants is consulted and control group surveys are conducted on both potential candidates and their guardians.

**Analysis of PA Directorate Data:** PA Directorate of Bangladesh Army Headquarters deals with the total selection process of all officers of Bangladesh Army. The total number of initial applicants for the officers of Bangladesh Army for last 7 years are shown in Table 1. The application state in 7 years and the trend line show a distinct downward trend reflecting a gradual drop of attraction to this noble profession.



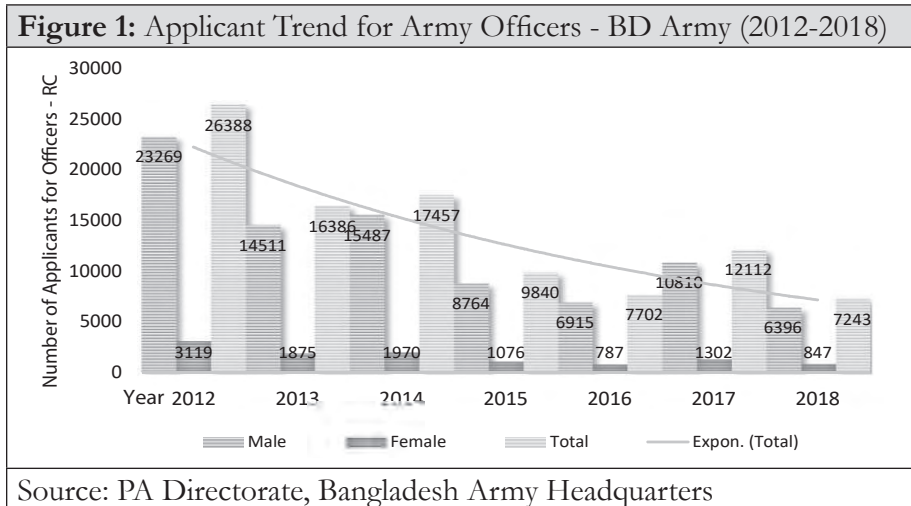
## Applicant State-Officers of Bangladesh Army (2012-2018)

**Table 1: Application State for Officers - Bangladesh Army (2013-2018)**

Serial	Year	Long Course Name	Total Initial Applicants (Including Civil Colleges, Cadet Colleges, BNCC, MCSK)		
			Male	Female	Total
1	2012	70 LC+71 LC	23269	3119	26388
2	2013	72 LC+73 LC	14511	1875	16386
3	2014	74 LC+75 LC	15487	1970	17457
4	2015	76 LC	8764	1076	9840
5	2016	77 LC	6915	787	7702
6	2017	78 LC+79 LC	10810	1302	12112
7	2018	80 LC	6396	847	7243

Source: PA Directorate, Bangladesh Army Headquarters

## Applicant Trend-Officers Bangladesh Army (2012-2018)



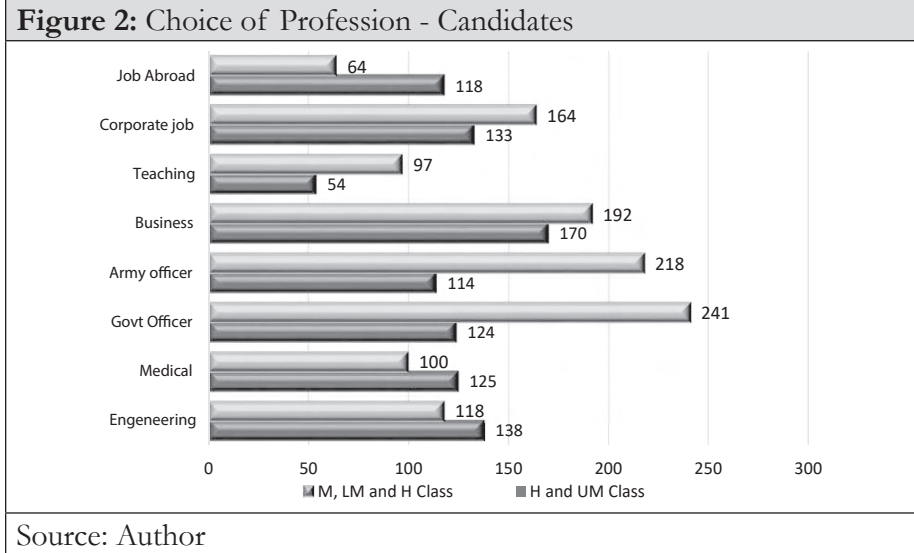
## Survey on Potential Candidates and Guardians

**Design and Objectives:** The survey was conducted on 110 respondents (potential candidates) from Dhaka city and Gazipur district. 50 respondents were also surveyed from the same areas to get their responses in similar areas. The surveys were intended to identify following:

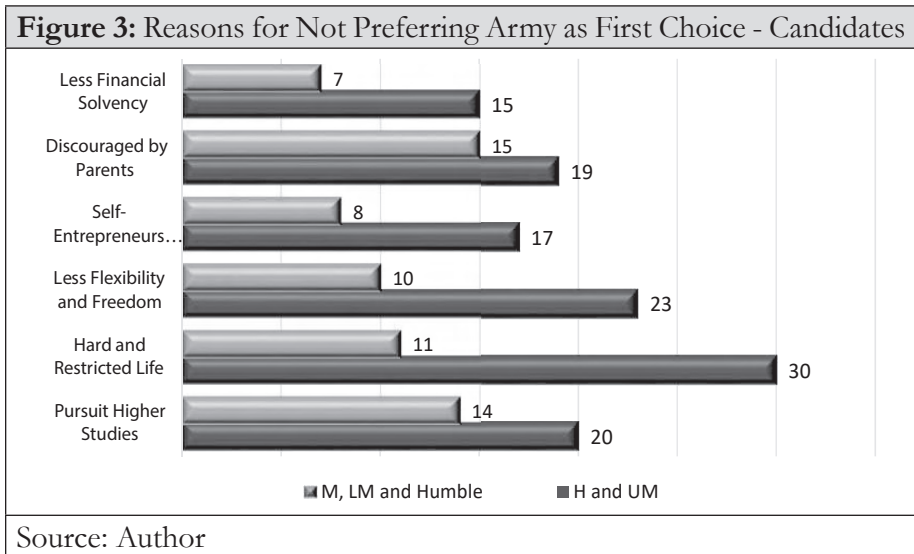
- The relative attraction of the profession ‘Army Officer’ to the potential candidates from different SES.
- The reasons to potential candidates for not choosing ‘Army Officer’ as the first choice of profession.
- Parameters/ considerations to potential candidates for choosing a future profession.
- The relative attraction of the profession ‘Army Officer’ to the guardians of potential candidates from different SES.
- The reasons to guardians of potential candidates for not choosing ‘Army Officer’ as the first choice of profession.
- Parameters/ considerations to the guardians of potential candidates for choosing a future profession.

## Survey Findings

**Attraction of the Profession ‘Army Officer’ - Candidates:** Potential candidates from High and Upper Middle Class have chosen “Business” as their 1st preference. “Engineering” was preferred as 2nd; “Corporate Jobs” as 3rd, “Medical” as 4th, “Government Civil Officer” as 5th and “Job Abroad” as 6th. Army Officer” was opted as 7th preference and “Teaching” as 8th. On the other hand, potential candidates mostly preferred “Government Civil Officer” as their most desired profession. “Army Officer” as 2nd; “Business” as 3rd, “Corporate Job” as 4th, “Engineering” as 5th, and “Medical” as 6th. The 7th and 8th preferences were the “Teaching” and “Job Abroad” respectively. Details are shown in Figure 2.

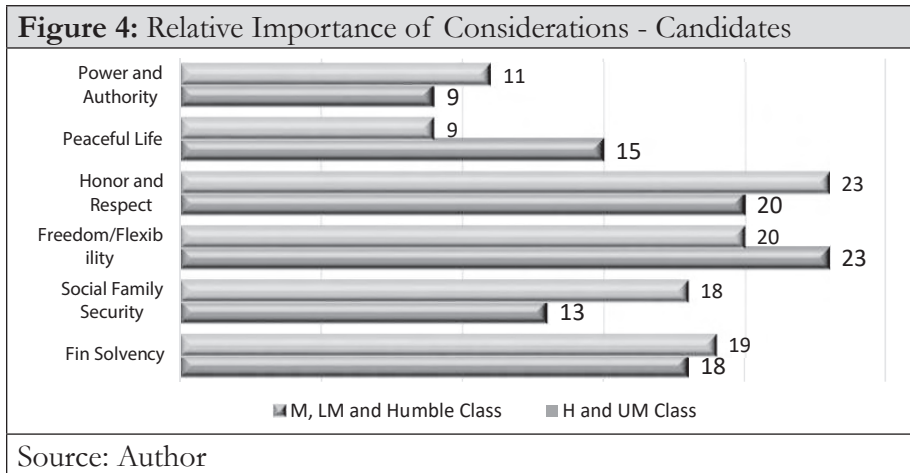


**Reasons for Not Preferring Army as First Choice - Candidates:** The graphical representation of the findings is shown in Figure 3.

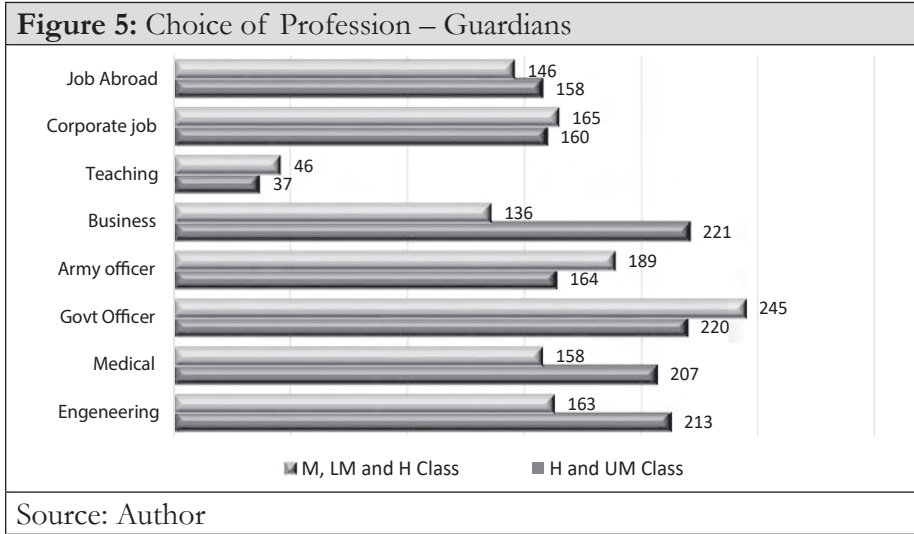


**Relative Importance of Considerations for Choosing a Future Profession - Candidates:** Potential candidates were given five fixed and one open option and were asked to determine the relative importance of

each of the considerations for choosing a future profession. The details of the preferences are shown in Figure 4.

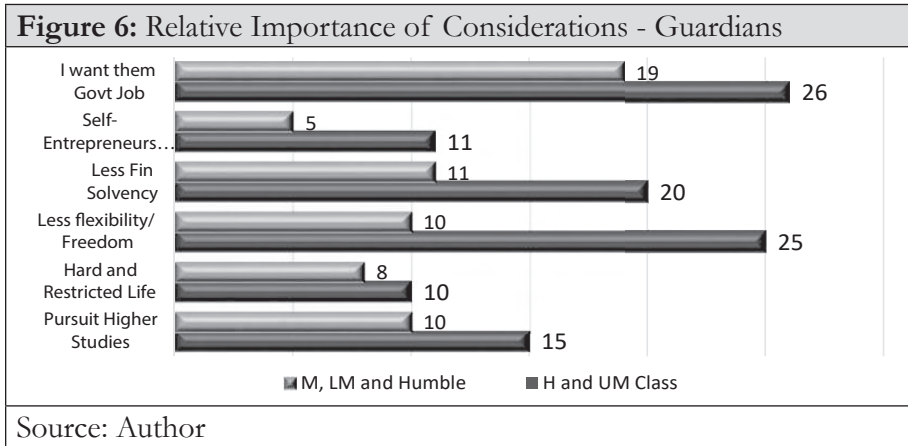


**Attraction of the Profession ‘Army Officer’ - Guardians:** Guardians of potential candidates from High and Upper Middle Class have chosen “Business” as their most desired profession. “Government Civil Officer” were preferred as 2nd; “Engineering” as 3rd, “Medical” as 4th, “Army Officer” as 5th, and “Corporate Job” was opted as 6th preference. The 7th and 8th preferences were the “Job Abroad” and “Teaching” respectively. On the other hand, guardians from Middle, Lower Middle and Humble Class mostly preferred “Government Civil Officer” as their most desired profession. “Army Officer” were preferred as 2nd; “Job Abroad” as 3rd, “Engineering” as 4th, “Medical” as 5th, and “Corporate Job” was opted as 6th preference. The 7th and 8th preference were the “Business” and “Teaching” respectively. Details are shown in Figure 5.



**Reasons for Not Preferring Army as First Choice - Guardians:** As reasons not to prefer ‘Army Officer’ as 1st preference, potential candidates from H and UM class response value were: 30 for “hard and restricted life”, 20 for “higher Studies”, 17 for “self-entrepreneurship”, 19 for “Discouraged by parents/ relatives”, 23 for “less flexibility and freedom in family life” and 15 for “less economic solvency”. In case of M, LM and H classes, the values were 11, 14, 8, 10 and 7 respectively.

**Relative Importance of Considerations for Choosing a Future Profession - Guardians:** Guardians of potential candidates were given five fixed and one open option and were asked to determine the relative importance of each of the considerations for choosing a future profession. The details of the preferences are shown in Figure 6.



**Summary:** The above data analyses reveals interesting but consistent findings. These are:

- Army Headquarters data shows that the number of initial applicants for RCs are in downward trend even at present time when number of HSC passing students have increased significantly comparing to the past.
- ISSB data shows that the total share of candidates from High and Middle Class SES, which are likely to make better quality officers in the long run are quite low and in a downward trend.
- On the other hand, the total share of candidates from L Medium, Medium and Humble Class SES is relatively high and increasing gradually, from where the candidates generally possess lower potentials at quality candidates.

**Ways to Improve the Attraction:** Considering the general downward trend of overall candidates and more significant downward trend of High and Upper Middle Class candidates' interest to join BD Army, following steps may be taken.

## **Proper Projection of Positive Areas of Profession ‘Army Officer’ to the Civil Communities**

**Projectable Positive Areas:** The projectable positive areas of the career:

- **The profession of Army Officer is a Complete Way of Life.** The career is the balance of all necessary ingredients of an ideal profession. This is a complete way of life.
- **Honest, Respectful and Dignified Life:** Officers can lead a life of honour and dignity in BD Army.
- **Opportunity for Higher Education:** There are very good opportunities in Bangladesh Army especially for officers to pursue higher education. Some of these are mandatory graduation in the fields of Engineering and Business Administration in BMA, post graduations in different disciplines Staff College (DSCSC), National Defence College (NDC), Military Institute of Science and Technology (MIST) and Bangladesh University of Professionals (BUP).
- **Opportunity for Study Abroad - Military and Civil:** Bangladesh Army now offers diversified opportunities for higher education to her members. Army officers now a days even can avail army sponsored scholarship and study on leave abroad.
- **Cutting Edge Medical Facilities for Self and Family:** The officers of Bangladesh Army and all members of Bangladesh Armed forces are offered with cutting edge medical facilities from CMHs located in different stations.
- **High Status in Government Warrant of Precedence:** Bangladesh Army gives this opportunity to all her officers relatively earlier than any other organizations, where an officer immediately after commission achieves the rare honor of First Class Gazetted Officer of Bangladesh Government.

- **Family and Social Security:** Bangladesh Army is a career destination that can offer such desired security to her members in present social system. Army offers accommodation, healthcare, education and social security to individual and family. This is a huge strength for the profession.
- **Educational Facilities for Children:** Bangladesh Army has developed excellent educational facilities for the children of her members. Good quality educational institutions including English Medium are available almost in all stations. There are even quotas for higher education in different institutions, colleges and universities of Armed Forces.
- **Financial Benefits including United Nations Peace Keeping Missions:** BD Army offers significant financial benefits through United Nations Peace Missions across the world.
- **Opportunities for Leadership:** For officers, working experience in BD Army is a huge opportunity for learning and practicing leadership and command.
- **Sound Social and Family Life:** Despite busy work schedule and 24/7 commitment, officers of BD Army gets an opportunity to enjoy sound social and family life. The organization promotes the significance of sound family and social life in all possible areas.
- **Opportunity for Healthy Lifestyle and Games and Sports:** BD Army gives enormous importance and opportunities to physical fitness as the profession by nature demands a minimum physical fitness for her members. Games, sports, physical training, discipline and routine life are the essential requirement of the organization.
- **Opportunity for Challenging Profession:** By nature, Army itself is a very challenging profession. The officers naturally can enjoy a very challenging and thrilling profession.



- **Opportunity to Serve the Nation Directly:** The officers of Bangladesh Army, someone has the opportunity to serve the nation directly. Military people are motivated and oath bound even to make supreme sacrifices for the cause of the nation, as such their contributions are direct and enormous.

**Measures and Means for Proper Projection:** Some of those means could be as following:

- **Aggressive Promotion in Electronic and Print Media, Social Media and Internet:** Publish and broadcast various professional and social activities of army career. Making attractive programs, documentaries, telefilms and serials promoting the profession will draw more number of quality candidates.
- **Person to Person Communication (Speaking Well) by Army Officers Corps:** Army officers living – serving or retired should work as ambassadors and promoters of this noble profession to civil society in general and to their community in particular. They should not talk ill or undermine the profession to their relatives or known people.
- **Motivation Programme by Civil Society:** The civil society should be utilized in the promotion process. A good rapport and understanding with the civil society should be developed for this. Various national days may be targeted for that.
- **Motivation to Schools and Colleges:** A team of officers specially selected by Army Headquarters or formation may periodically visit well reputed colleges highlighting the prospects and facilities of army life to attract the potential candidates.
- **Billboards and Leaflets:** Army can prepare attractive advertisement and billboard by professional advertisement firm highlighting various perks/facilities of the army.

- **Posting Good Officers in Public Appointments and Cadet Colleges:** Officers with good professional record should be posted to cadet colleges and BNCC so that potential candidates coming to their contact are encouraged by the officers.

**Increase the Attraction:** The attraction of the career may be increased by:

- **Review of Defence Service Pay/ Pay Scale:** In many Armies of the world including Indian Army have separate pay scales which are different to general pay scale. Therefore, the defence service pay or the pay scale as a whole may be reviewed.
- **Eliminating Financial Differences with Civilian Counter Part, Like House and Car Loan etcetera:** Even in the existing pay scale, civilian officers of same grade at times receive better benefits than military officers. Recently introduced 'Car Loan' is one of such benefits. As such steps may be taken to eliminate such financial differences with civilian officers.
- **Increasing Opportunities for Existing Higher Education System:** Quality students always have a desire to pursue higher studies. Though Bangladesh Army already increased the opportunities for higher education, yet it could be increased further. At the same time the process of pursuing higher studies may be made easier.
- **Making Voluntary Retirement Easier:** Due to various reasons, officers sometimes apply for voluntary retirement. But the voluntary retirements in Bangladesh Army is quite cumbersome and often delayed, which infuses a sense restriction in officers' minds. As such the voluntary retirement process should be made easier and officers should be able to retire if they like to do so.
- **Adding Flexibility within Rules:** By nature, military is a full time job where officers are committed with diversified tasks involving war and peace time. At the same time Army being a disciplined force has

so many rules regulations and bindings. As such the life automatically becomes quite difficult and inelastic. As such efforts may be taken by senior leadership to reduce tension and to infuse flexibility, but of course within rules.

## **Recommendations**

The following recommendations are made in order to increase the interest and attraction of potential candidates, especially quality ones and their guardians towards the profession of ‘Army Officer’:

AHQ should launch an aggressive marketing campaign to promote the career of “Army Officer’ to potential candidates so that are inspired and motivated to join Bangladesh Army as officers. The promotion campaign should utilize electronic, print and social media to reach as many target population as possible. Internet should be used extensively. Person to person communication (speaking well) by the serving and retired army officers, motivation programme by the civil society, motivation to maximum number of colleges by the specially selected officers, posting good officers in public appointments and cadet colleges and extensive utilization of billboards and leaflets should be made for this purpose.

The following strengths and benefits of the profession “Army Officer’ should be highlighted in the promotion and motivation campaign:

- The Profession of Army Officer is a Complete Way of Life.
- Honest, Respectful and Dignified Life.
- Opportunity for Higher Education.
- Opportunity for Study Abroad - Military and Civil.
- Cutting Edge Medical Facilities for Self and Family.
- High Status in Government Warrant of Precedence.
- Family and Social Security.
- Educational Facilities for Children.

- Financial Benefits including United Nations Peace Keeping Missions.
- Opportunities for Leadership.
- Sound Social and Family Life.
- Opportunity for Healthy Lifestyle and Games and Sports.
- Opportunity for Challenging Profession.
- Opportunity to Serve the Nation Directly.

The attraction of the career “Army Officer” may be further increased by:

- Increasing Opportunities for Existing Higher Education System
- Making Voluntary Retirement Process of Officers Easier.
- Adding the Freedom and Flexibility within Rules.
- Army Headquarters (AHQ) may pursue government to with following steps to increase the monetary benefits of the profession by reviewing the existing Pay Scale/ Defence Service Pay/ and eliminating monetary differences with the civilian counterpart.
- Officers should be logically trained and educated for the second career, so that they can lead a prestigious life after retiring from Bangladesh Army. The voluntary retirement process should be made easier if someone opts to do so.
- A comprehensive study can be conducted by AHQ so that Job Safety and Social Security can be augmented remaining within rules and organizational culture to be developed so that it reduces tension in life and adds flexibility within rules.

## **Conclusion**

Analyses of different economic and social indicators give a clear indication that Bangladesh has achieved a significant socio economic development in in the recent years. Though, the economic and social developments were not symmetrically distributed throughout the country, still an overall positive

indication was very much visible. Thus, it can be deduced as a general statement that Bangladesh has achieved a significant social development in last ten years.

The rapid socio economic developments in Bangladesh has not only created wider educational/ career opportunities and job options for young generation, but also has significantly influenced potential candidates' mindset and choice of profession. People now have much wider and diversified options to choose their career from. Alongside, educational facilities, particularly with good number of quality universities have also increased manifold yielding options for higher studies which were not available before. The young people now prefer to pursue many other new professions in the changed socio economic condition. As a result, the once coveted profession "Army Officer" is no longer an attractive profession as it was before one decade.

The downward trend of candidates' interest to join Bangladesh Army has been vividly seen in the data of "Number of Initial Applicants for Long Courses in Last 7 Years". The total applicant number of applicants fallen to 7243 in Year 2018 from 26388 in Year 2012<sup>4</sup>. Again the ISSB data shows that, the percentage of candidates from relatively better SES (High and Upper Middle), from where the candidates possess higher potentials of quality intake has reduced significantly comparing to the relatively lower SES (Middle, Lower Middle and Humble) candidates. As a result, the significantly reduced attraction of candidates in general, and comparative reduction from higher SES in particular might be identified as the potential reasons of downward trend in quality of officers' intake within the studied period (2012-2018).

The study also identified the relative attraction of the career to potential candidates and their guardians in the changed socio-economic condition. The important parameters for choosing a future profession to the candidates have also been identified through survey, which are namely freedom and flexibility, financial solvency, higher studies etcetera. Finally, it

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4 PA Directorate, Bangladesh Army Headquarters

is strongly felt from the findings of the study that, immediate steps should be taken by appropriate authority to inform, inspire and motivate potential candidates to join Bangladesh Army as officers. Maintaining a rich and stable flow in the selection inlet, especially with a balance from all SES will be of paramount importance for Bangladesh Army to maintain its traditional high standard of officers.

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# **‘ONE STOP’ HARDWARE ACQUISITION TREND IN BANGLADESH NAVY: CHALLENGES AND WAYS FORWARD**

**Commander K M Emon Rashid, (ND), afwc, psc, BN**

## **Introduction**

Dependency on a single country for foreign military hardware acquisition may lead to a trap for any navy. When a navy possesses a majority of platforms and ammunition from a single source, its warfighting capabilities becomes dependent on that supply source. On the other hand, war being a complex affair, there remains no assurance that the single source will supply war materials during the conflict. It may so happen that supplier country may not support the war effort of Bangladesh based on her own national interest. In a worst-case scenario, the supplier may even support the adversary for her own benefit.

As geopolitics has a major role to play in the present world order and individual countries act differently basing their own national interest, a majority of weapon acquisition from a single country may result in the crisis time supply chain break. Hence, it is time to examine the present hardware acquisition trend for fleet development, address the challenges and explore possible alternatives for Bangladesh Navy (BN). The paper would benefit Bangladesh Navy to ascertain the present acquisition trend and eventually discover the effects and finally search for alternatives.

## **Present Acquisition Trend of Bangladesh Navy**

After analyzing the platform acquisition trend of BN, it has been seen that the majority of the fighting platforms of Bangladesh Navy were procured from China and the others were from the United Kingdom and only one platform from South Korea. Indigenously built ships comprise 11% of

the total force of BN. Again, the guns were acquired from five different countries. Most of the ship’s guns are of Chinese origin<sup>1</sup>. Similarly, majority of the missiles are also of Chinese origin. Consequently, China being the major hardware supplier of BN, the majority of equipment-based training are being conducted in China. Allotted courses for overseas training in FY 2017-18 shows that 69% of courses on hardware were arranged in China.

## Factors Leading to Purchase of Majority Naval Equipment from China

The demand for arms of various types is influenced by security perceptions of internal or external threats and by price and income, which determine what a state can afford. Following are the factors leading towards Chinese hardware acquisition trend in BN:

- Cheaper Weapons:** Due to the availability of cheap weapons produced by China, countries used to buy second-hand cold war weapons, are now purchasing new replica of the USA or Russian weapons with increased sophistication and lethality. Presently China is producing submarines, aircraft carriers, destroyers, frigates and corvettes. Availability of such diversified and easily accessible weapons with cheaper price is attracting buyers around the world. The following table shows the cheaper cost of frigates offered by China in comparison to other four western countries.

<b>Table 1: Comparison of Ship Building Cost</b>						
	Cost in Million Dollar					
	China	USA	Norway	Denmark	Spain	Russia
Frigates	200 (053H3 FFG)	637 (Freedom LCS)	557 (Nansen class)	269 (Absalon class)	600 (Bazan class)	1 billion \$ (Grigorivitch- class)
Source: Compiled by Author <sup>2</sup>						

1 Kawsir, Capt. (2018, June 6).

2 Business Standard. (2018, July 16). Frigate purchase from Russia hit by high cost of warship building. Retrieved from Business Standard: [https://www.business-standard.com/article/economy-policy/frigate-buy-from-russia-hits-high-cost-of-warship-building-118071600029\\_1.html](https://www.business-standard.com/article/economy-policy/frigate-buy-from-russia-hits-high-cost-of-warship-building-118071600029_1.html)

- **Simplicity of Operating System:** In addition to being inexpensive, Chinese weapons are easy to operate as well as to maintain. These weapons are found attractive where technological knowledge of military professionals is low. In developing countries, this trend is usually high comparing to western weapons and sensors. Generally, western advanced weapons systems and sensors demand a high level of maintenance skill. Arrangement of training for such advanced weapons incurs additional load on naval budget.
- **Budget Constraint:** Naval budget takes the share of 12-13% of the total defence budget. Majority of the naval budget is generally allotted for maintenance and capital purchase. Considering the cost of new ships in world market navy faces budgetary constraint in developing force structure.
- **Indigenous Capacity:** At present most of the shipyards in Bangladesh are not equipped with the man, machinery and equipment required to build large warships. These yards are mainly engaged in building and repairing of inland and coastal vessels, up to 3,500 DWT. However, Ananda Shipyard and Slipways Limited, Dhaka and Western Marine Shipyards Limited, Chittagong are manufacturing ships of 10,000 DWT. Since no shipyard has yet built any frigate sized warship, lack of experience and confidence generally motivates buyers to resort to purchasing of ship from abroad.
- **Problems in Procurement Process:** New acquisition of BN encompasses new ships, submarines, aircrafts, weapons, systems and off the shelf platforms subject to the government decision. In the case of the capital purchase, detail planning is necessary. Due consideration is to be given as to what would be the requirement of spares, how it would be met, whether spares are available in the market, whether maintenance support system is existing in navy or whether the running of machinery/equipment will be economical for navy etc. As new acquisitions are involved with huge monetary matters, undesirable external influences i.e. political influence, lack of diplomatic efforts,

inexperience participations in tendering, corruptions, nepotism etc may tend to play a major role in the process. To make things worse, internal influences like lack of information, inadequate flow of information, lack of long-term goal, lack of coordination and synergy, ad-hoc decision making, frequent transfer of BN officers, the incompetence of concerned personnel also appear in the scene.

- **Robustness and Easy of Access:** Generally, Chinese hardware are robust in nature. Again, the Chinese government gives easy access to sophisticated weapons for the sake of business. On the contrary, access to western weapons is more difficult. Thus, ease of access is one of the motivating factors for purchasing Chinese hardware.

## Case Study 1

Naval Weapon Acquisition Trend of BN Comparing to Other Countries of the World. A case study conducted by the author on five different navies to examine the pattern of capital ship acquisition trend and compare the same with the present naval fleet of Bangladesh. Selection of country for this case study was based on GDP<sup>3</sup>, Global Firepower ranking, number of naval assets, coastline, naval budget<sup>4</sup> and geographical position. India and Myanmar were selected as neighboring country. Whereas Philippine was selected as the nearest militarily capable (according to Global Firepower Index) country in Asia. Again, selection of Singapore was based on the considerations to examine the acquisition trend of a developed yet smaller country in Asia.

While comparing the trend of naval platform acquisition in accordance with the list of naval platforms of above countries, it was found that Indian and Singapore Navy is mostly based on indigenously built ships, which comprises 60% and 56% of the fleet respectively. Again, Philippine navy's

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3 Static Times. (2018). Projected GDP ranking. Retrieved from Static Times: <http://statictimes.com/economy/projected-world-gdp-ranking.php>

4 Global Firepower. (2018). 2018 Military Strength Ranking. Retrieved from Global Firepower: <https://www.globalfirepower.com/countries-listing.asp>

majority of the fleet comprises of US origin ships. Which comprises 56% of the fleet. None of these three countries possess ships made in China. On the other hand, Bangladesh and Myanmar are heavily dependent on Chinese ships. Both the countries possess 44% and 42% Chinese ships in the inventory respectively. Salient findings are given in the table below.

<b>Table 2: Salient findings from case study- 1</b>				
	Majority of ship	Indigenous capability	Fleet diversification (acquisition from different countries)	Liability on a specific country
India	India	60%	3	Russia
Bangladesh	China (44%)	23%	5	China
Myanmar	China (42%)	28%	9	China
Singapore	Singapore	56%	7	Australia
Philippine	USA	56%	9	USA
Source: Compiled by Author				

Impacts of Single Source Hardware Acquisition Trend in BN. Single source (or sole source) is considered to be risky from a traditional point of view, thus buyers are usually advised to avoid it. Effects of single source procurement trend in BN is appended below:

- **Impact on Supply Chain:** Dependency on a single source supplier for major hardware can lead to supply chain risk. Any disruption of supplier can lead to the detrimental effect on own supply chain. Especially in the case of navy where operational availability of ships and crafts are heavily depended on spares and constant support of supplier, maintenance of supply chain bears paramount importance.
- **Effect on Product Quality:** Quality is a frequently discussed issue related to Chinese origin products. One of the overriding merits of

Chinese hardware is the cheaper price than that of western counterpart with same type or configuration. But this factor does not remain cost effective considering the operational availability, maintenance longevity and reliability.

- **After Sales Service:** Most of the Chinese equipment starts malfunctioning within few months of commissioning. Though Chinese suppliers agree to provide warranty service, in reality, the warranty time passes in correspondence and sending defective item to China. Thus, warranty period is hardly enjoyed by the purchaser. Sometimes they also offer up gradation of the system in a very short period of commissioning. But western manufactures maintain the flow of supply in terms of spares and after sales service.
- **Obsolescence of Technology:** In China, all the military instrument factory/ institutes are state owned. They require permission from the government for the export of any equipment. The government generally permits the export of older technology. Therefore, even the item is bought newly, the chance of obsolesces remains very high. On the other hand, most of the western military manufacturers are private owned companies. Hence the purchaser remains free from the adverse effect of technological obsolescence<sup>5</sup>.
- **Arms Race:** Availability of cheap weapons in the world market has led to massive militarization and promoting mini arms race within developing countries around the world. This trend is creating a dangerous hotbed for the confrontation between these countries<sup>6</sup>. There has been a sharp rise in the military spending within the developing countries. Because of the cheaper price and easy availability, purchase of new consignments and systems of arms by one country automatically ignites similar or larger movement by neighboring countries. Table 3 shows how both Bangladesh and Myanmar are increasing their Armed Forces through the acquisition of cheaper weapons from China.

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5. Mahbubur Rahman, C. (2018, June 14). Impacts of Chinese Hardware Acquisition. (C. Emon, Interviewer)

6. ANDERTON, C. (1986). Arms Race Modeling: Systematic Analysis and Synthesis. Ph.D. thesis, Cornell University., 347

<b>Table 3: Trends in International Arms Transfer 2015</b>				
Exporter	Share of International Arms Export (%)	Main Clients (share of total export %)		
		1st	2nd	3rd
USA	33	KSA	China	Vietnam
Russia	25	India	China	Vietnam
China	5.9	Pakistan	Bangladesh	Myanmar
France	5.6	Morocco	China	Egypt
Germany	4.7	USA	Israel	Greece

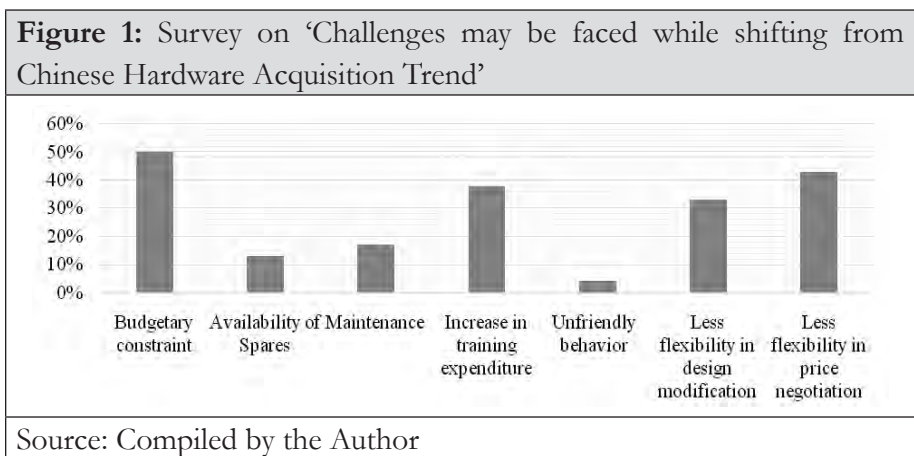
Source: SIPRI Military Expenditure Fact Sheet 2015

- Technology is Determining Tactics:** Superiority in technology can change the outcome of any naval battle. Thus, naval tactics are based on available technology. Hence navies should be cautious while planning any capital platform or sensors. Due care is to be taken to ascertain the possible adversaries force structure. Mere purchasing cheaper platform may not provide much dividend. Even purchasing same type and class of platform and weapon as of adversary does not place in superior capability in the battlefield. Acquiring the same sensors also put navy in danger of confidentiality disclosure. There seems to be similarity of Frigate acquisition trend between BN and Myanmar Navy from China. This does not help BN to achieve superiority in terms of fighting power rather bring parity which eventually leads to another acquisition within a short period.
- Role Play by Supplier Country:** Procurement of majority hardware leads to over dependency on the supplier country. Navies should not be dependent on any single country. As the international politics changes very frequently and there is no permanent friend in international politics, thus today’s friend may turn into a foe tomorrow.



- **Geopolitical Influence:** In today’s warfare era, no one can fight alone. Thus, geopolitics plays a vital role in crisis situations. In the era of globalization, the free flow of trade creates dependency between the states. As a result, states create alliances to protect each other’s interest. Thus, irrespective of the justification and the cause of conflict, other countries are normally inclined towards own interest while supporting any party to the conflict.
- **Impact on Indigenous Capacity Building:** Easy access and availability of cheaper hardware is discouraging the policymakers in developing the indigenous capacity building in shipbuilding sector. Despite being one of the pioneer countries in shipbuilding sector, Bangladesh now has to buy ships from other countries. Bangladesh has a huge opportunity in this sector which has not been effectively explored because of the availability of cheaper platforms in the world market<sup>7</sup>.

**Challenges to Shift from Chinese Hardware Acquisition Trend:** Military hardware are costly. These are even more costly when the supplier is a western origin country. Besides, there are few more challenges that might arise while shifting from the present acquisition trend.



7. Bashar. (2018, May 14). One Stop Hardware Acquisition Trend. (C. Emon, Interviewer)

- **Requirement of Increased Budget:** A large quantity of less capable ships need sufficient maintenance budget and more men to operate them all. Thus, maintaining a large quantity or a qualitative naval fleet for BN will be a never-ending battle due to its economic constraints.
- **Maintenance and Availability of Spares:** Acquisition of ships from different countries will lead to the requirement of more line item management. This will encompass additional transportation cost. Managing more line items will also add the cost of additional manpower and overhead cost. Moreover, purchasing from a single supplier eventually develops supplier-buyer relationship by which buyer gets the advantage of price negotiation and design modification. Turning towards diversified supplier will allow the buyer to enjoy exclusive contractual agreement. Again, in certain major faults expert of the company has to be brought to physically assist in repair work. In those cases, western companies will charge more than the Chinese ones.
- **Training:** Diversified acquisition will require expert personnel on different types of weapons and sensors. This will create additional pressure on the training budget, as officers and sailors will have to be sent to different countries around the world. Even this additional pressure is not a once in a life cycle issue. Rather to maintain continuous availability of expert personnel the additional pressure on the training budget will continue to exist<sup>8</sup>.
- **Cost Degradation:** Multi sourcing policy helps in price negotiation. However, in most of the cases, Chinese bidders come as lowest ones. Thereby multi sourcing may not help much in the case of reducing the cost of items. Again China being the country of the largest number of suppliers in the world can easily accommodate less demand within their huge production line. Many of the western suppliers will not agree to supply a smaller number of items. In that case, the buyer may have to demand a greater number of items to catch supplier attention<sup>9</sup>.

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8. Shahriar Alam, C. (2018, May 4). Abroad Training in BN. (C. Emon, Interviewer)

9. Wang, S. (2015, July 15). The case for single sourcing procurement. Retrieved from In touch manufacturing services: <https://www.intouch-quality.com/blog/case-single-source-procurement>

- **Western Business Culture:** The Chinese place more emphasis on relationships when it comes to their business culture in contrary to the western counterpart. Relationships with long term cooperation between companies can reduce the suppliers' market efforts and risks. So, the suppliers would often rather accept a lower price to keep this long-term relationship going. This makes them more cost-effective than their competitors. This is often not experienced within the western business trend.
- **Reduction of Vacancies and effect on Morale:** A prudent British naval commentator forecasted that these quality centric small navy is bound to be inefficient and cost-ineffective for the following reasons: "There can be no adequate flow of promotion, no large system of training (the cost of naval training establishments will necessarily prohibit this), no opportunities can exist for giving wide sea-going experience with big fleets, and, unless great expense is incurred, the material cannot be kept up to date." Hence, a careful balance is required for the quest of technological marvel and handy fleet size.

## **Alternatives of One Stop Hardware Acquisition Trend**

Considering the adverse effect of single source procurement trend, it is the call of time to shift towards an alternative. This statement was again verified by a survey conducted by the author where the majority of the respondents opined that BN should not be dependent on a single country in terms of hardware.

**Implementation of Pragmatic Process:** Shifting from Chinese origin ship acquisition trend needs a pragmatic process to be followed. Following factors are to be adhered to for effective implementation of the process:

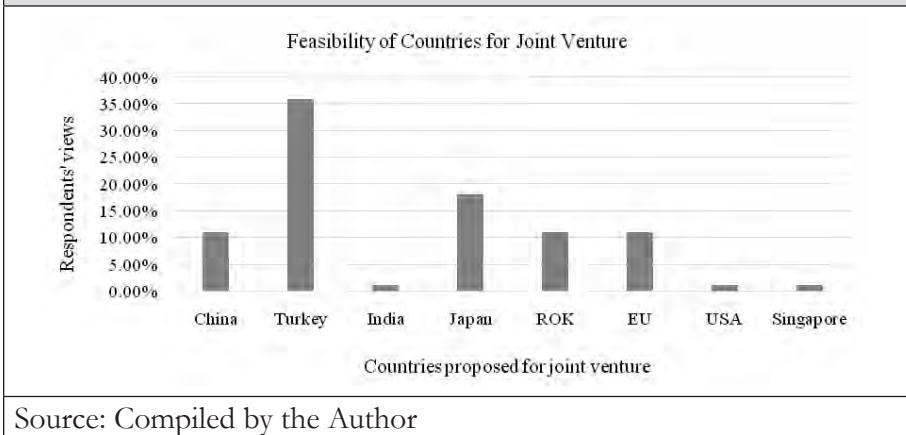
- **Indigenous Ship Building:** Increased shipyard capacity for construction of ships, repair, and maintenance will provide immense benefit for BN. As such, necessary progress is to be made in the field of designing, mechanical and electrical subcomponent systems of

commercial ships. These will directly benefit BN through dual-use of technologies. Slow, but steady development of indigenous medium-speed diesel engine productions will also provide direct relief to the BN’s current reliance on imported propulsion technology. The growth in cumulative experience within the commercial shipbuilding industry may provide a valuable technical foundation of human capital from which BN may draw necessary experience in building more complex warships. Bangladeshi naval architects, mechanical engineers, welders, and shipyard laborers will gain experience in commercial shipbuilding represent a strategic ready reserve of fundamental shipbuilding skills with portability to military production if ever needed.

- **Inter-Governmental Commission on Technical Cooperation:** There is an inter-governmental commission on technical cooperation between India and Russia. Myanmar also has a military cooperation agreement with Russia (Maritime Executive, 2018). Bangladesh may opt for such inter-governmental cooperation with other countries.
- **Joint Development and Production:** Bangladesh being one of the major warship purchasing buyers from China, may initiate joint venture proposal with China or any other country which may deem feasible.
- Again, to explore the favorable countries for joint venture project, another survey was conducted by the author. Result of the survey is shown in figure 2.
- **Senior Leadership Training to Read the Mind of Western Counterpart:** Frequent training may be arranged for senior military leaders, to read the mind of the western counterpart. This will enhance interpersonal relationship. It has been experienced that interpersonal relation even helps in reducing the price on the negotiation table.
- **Government Initiative to Change Mindset:** India has shifted their focus from overseas procurement to indigenous capacity building and moving ahead with “Make in India” slogan. Even Myanmar possesses

more indigenous ships in their inventory than that of BN. Navies should be primarily dependent on their own industries of the country or to some other country where a conflict of interest may not occur between the countries. The government may take the lead to change the mindset from the cheaper hardware of China to the more qualitative source of other favorable countries<sup>10</sup>. An inter-ministerial committee may be formed to propose and implement such initiative.

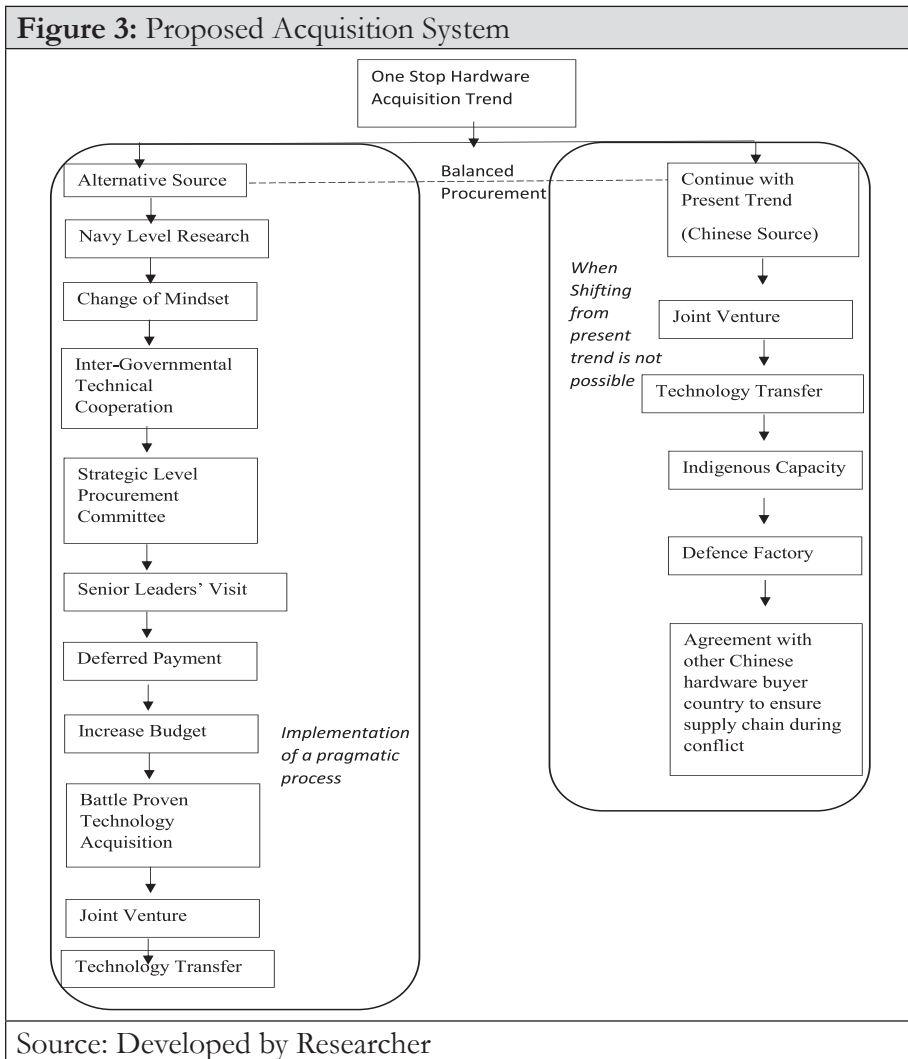
**Figure 2:** Survey result on ‘Feasibility of countries for the Joint venture with BN’



- **Battle Proven Technology Acquisition:** Acquisition of new unknown technologies may offer two-pronged problems. Firstly, newer technology costs disproportionately high and unproven technology may fail to prove service worthiness. Hence, it is always safer, for BN, to wait for someone else to take the risk. Therefore, BN should look for battle proven and reasonably modern technology.
- **Holistic Framework for Sustainable Force Development:** Promulgation of a holistic framework for sustainable development is mandatory for any navy. Thus the development circle should be pragmatic enough, considering the challenges and long term effects. Forming a strategic level defence procurement committee may be a feasible option for such sustainable development.

10. Niamul Hasan, c. (2018, September 11). Chinese Hardware acquisition. (C. Emon, Interviewer)

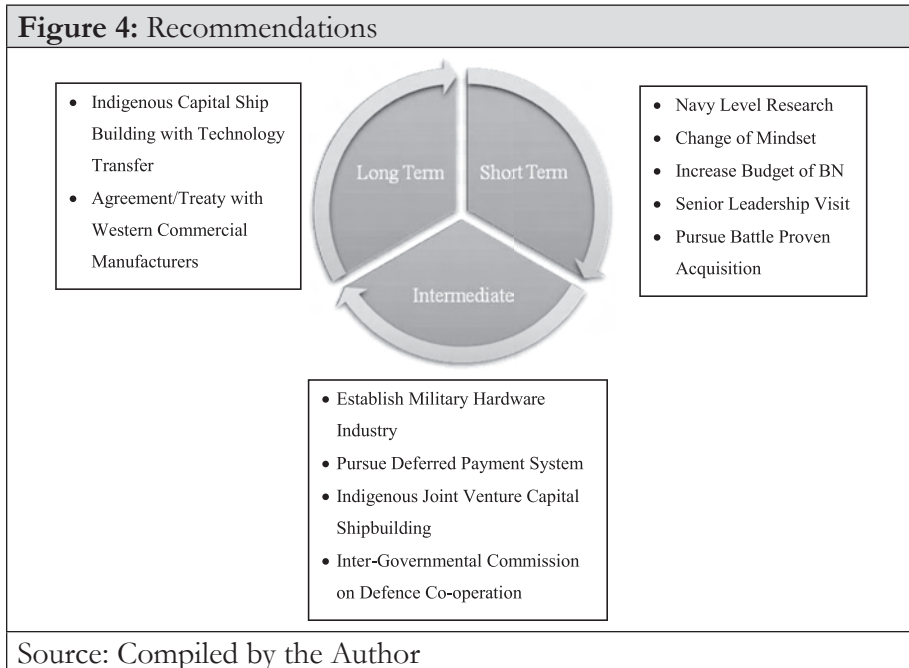
- Implementation of Deferred Payment:** Capital purchase from western countries will incur more money than that of China. Thus implementation of deferred payment process will be necessary to reduce unusual pressure on the budget<sup>11</sup>. Military cooperation, bilateral engagements and defence dialogues with the seller country will ease the process of procurement.



11. Zamil Hossain, C. (2018, September 11). Impacts and ways forward of Chinese Hardware Acquisition. (C. Emon, Interviewer)

## Recommendations

A realistic approach encompassing short, intermediate and long-term measures may be taken to move away from present ‘One Stop’ hardware acquisition trend of BN and shift towards alternatives.



## Short Term Measures

- **Navy Level Research:** An extensive Navy level research may be carried out to find a list of suitable Western/European countries where it will be feasible to shift our focus for capital ship purchase or hardware acquisition.
- **Change of Mindset:** A change in mindset from highest to naval policymakers is exceedingly necessary to change this ‘One Stop’ trend. As such, Government may take the lead role and form an Inter-Ministerial Committee to propose and implement such initiative. Naval experts may be incorporated in that committee to provide necessary inputs.

- **Increase Budget of BN:** Navy may originate necessary persuasion to the Government for increasing the naval budget to a significant quantity which will allow to purchase/acquire western ships/hardware.
- **Frequent Senior Leadership Visit:** Senior Government and Naval officials may have frequent visits in those short-listed countries to read the mind of their Government & commercial manufacturers and create good inter-personal relationships for easy future procurements.
- **Strategic Level Procurement Committee:** The government may form a strategic level defense procurement committee for pragmatic and sustainable future force development in future.
- **Pursue Battle Proven Acquisition:** BN may pursue battle proven and reasonably modern technology for future procurements which might have an upper edge over our potential adversary’s same category platforms/armaments/sensors.

## Intermediate Measures

- **Establish Military Hardware Industry:** The government may establish more military industries to support indigenous shipbuilding and manufacture spare parts/armaments/sensors in future. In the long run, these would help us to attain independent capital ship building capability.
- **Pursue Deferred Payment System:** Western/European countries & commercial manufacturers may be pursued for accepting deferred payment system mentioning our budgetary constraint to avoid single payment burden.
- **Indigenous Joint Venture Capital Shipbuilding:** Necessary infrastructures may be constructed at CDDL for indigenous capital shipbuilding in Joint Venture with a suitable country. While selecting a country for joint venture, foreign policy/relationship/defense co-operation with our neighbors may be addressed with due priority.



- **Inter-Governmental Commission on Defence Co-operation:** An Inter-Governmental Commission on Technical Co-operation may be formed with a technologically advanced country to attain joint combat readiness. Necessary agreements/treaties may be prepared for defense co-operation, training, supply of spares, Research and Development. Provisions may be kept to transfer the technology in future for attaining independent shipbuilding capability.

## **Long Term Measures**

- **Indigenous Capital Ship Building with Technology Transfer:** After having reasonable indigenous capital ship building experience in joint venture, BN may envision for independent capital ship building at home yards with Technology Transfer.
- **Agreement/Treaty with Western Commercial Manufacturers:** Through Government level, BN may pursue necessary defense agreement/treaty with Western/European commercial manufacturers to supply sensors/armaments/spares till we attain that capability to manufacture at own industries.

## **Conclusion**

Dependency on a single country for foreign military hardware acquisition may lead to a trap for any navy. Recent trend of Bangladesh Navy's acquisition process is concentrated on cheaper and easily accessible arms transfer source of China. The factors driving towards purchasing Chinese origin hardware are the availability of cheaper hardware, budgetary constraint of BN, simplicity of operating system and easy access. Limitations in the procurement process, lack of indigenous capacity and geopolitical influence also play a vital role in this aspect.

As geopolitics has a major role to play in the present world order and individual countries act differently basing their own national interest, the

majority of weapon acquisition from a single country may result in a crisis time supply chain break. Other effects emanating from Chinese origin acquisition encompasses degradation of overall quality, unsatisfactory after sales service, and rapid obsolescence of technology.

To encounter these adverse effects of sole sourcing, indigenous capacity may be a preferred option for any state. Again, naval budget needs to be increased for qualitative force structuring. Along with these challenges, management of the additional line of spares and increased training expenditure will create increased burden on the budget. Moreover, shifting from present trend may lead towards cost degradation and limited flexibility in design modification with the seller.

Considering the adverse effect of single source procurement trend, it is the call of time to shift towards an alternative. Capacity building for indigenous production, joint venture with other countries, Intergovernmental commission for technical cooperation and above all change of mindset towards a holistic approach of capital ship acquisition may be few of the many ways out in this aspect.

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# INADEQUACY IN OPERATIONAL EFFECTIVENESS; QUEST FOR A SOLUTION IN BANGLADESH PERSPECTIVE

**Brigadier General Abu Sayeed Mohammad Ali, ndu,  
afwc, psc**

## **Introduction**

“Butter versus Gun” is an age old dilemma which is going on till date, especially in the third world developing countries like Bangladesh (BD). With the effect of globalization, concept of human centric security system is challenging state centric one and vibrant private sector made it more focused discussion today. With the trend of changing nature of threats, different types of conflicts are erupting around the globe and above all, the effectiveness of conventional forces’ response to those are seriously doubts the justification of having large standing Armed Forces. In the fast changing security environment, different countries have adopted different national security strategies. Some have given economic development more priority than defense when some of the regional countries have gone for collective security strategy like ASEAN etc. Robert S. McNamara, Secretary of Defense of US, said before the American society of newspaper editors, “Security is not military hardware, though it may include it. Security is not military force, though it may involve it. Security is not traditional military activity, though it may encompass it. Security is development. Without development, there can be no security”<sup>1</sup>. Today, BD is being confronted with threat of different dimensions, originating from both external and internal sources. Power struggle over Indian Ocean by three big actors like US, INDIA (IN) and CHINA (CH) have posed more security challenges for BD. Recent demarcation of maritime boundary with both the neighbours MYANMAR (MN) and IN have added a new chapter of security response

1. [2parse.com/?page\\_id=3385](https://www.2parse.com/?page_id=3385) Cached, Robert McNamara’s Speech on “Security in the Contemporary World” By Joe Campbell, accessed on 18 January 2015.

towards Blue BD in the south. Because Indian Ocean is now perceived to be the world's centre of gravity in strategic terms, proving the prophetic words that are often attributed to A.T. Mahan: "Whoever controls the Indian Ocean will dominate Asia ... the destiny of the world would be decided on its waters"<sup>2</sup>. On the other hand, constitution clearly states that "Safeguarding sovereignty and territorial integrity is the supreme and sacred duty of all citizens irrespective of cast and creed"<sup>3</sup>. With all these, today policy makers are facing ever more challenges and difficulties in negotiating dilemmas to develop a proper and appropriate defence strategy for the country.

## National Perspective

**Geo Strategic Settings:** BD's geographic location gives a distinct advantage of being the bridge between South and South East Asia with IN and MN on two sides and Bay of Bengal as third neighbour. BD is part of South Asia, which continues to be one of the most volatile regions, with three regional nuclear powers i.e, CH, IN and PAKISTAN. With the changed scenario, BD's geo strategic importance increased due to three factors. First, BD began to be referred to as the third largest Muslim country in the world and second in the South Asian region. Secondly, BD is located within the 'geo-strategic frontier' of IN, South Asia's most powerful country. Finally, BD being in close proximity to CH, Asia's largest power, considered as the strategic rival of both the US and IN. Recent shift of US policy of focus from Europe to Asia and three big actors' race for dominance over Indian Ocean further augments the importance. Thus prevailing geo-strategic environment poses challenge to BD's National Interest and Security. Beside economic development, IN is also modernizing her Armed Forces as part of the aspiration to be a super power. All these have created an environment of arms race in the region certainly not very conducive for BD. MN is opening up gradually for their march towards democracy, yet

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2. [http://idsa.in/strategicanalysis/36\\_3/IndianOceanNavalSymposium\\_PKGosh](http://idsa.in/strategicanalysis/36_3/IndianOceanNavalSymposium_PKGosh), accessed on 18 January 2015.

3. Constitution of the People's Republic of BD.

Rohingya issue is likely to have spillover effect in bilateral relationship. Large scale participation in UN peace keeping operations, huge Diaspora community and growing presence in regional and global bodies have increased BD's standing in world forum. BD is likely to become attractive destination for trade and investment provided it can meet the challenges like power crisis and political stability etc. Water sharing of common rivers will be a point of concern of the region having security impacts.

**National Interest:** National interests can be defined as nation's perceived needs and aspirations in relation to the internal and international environment. Government has to concern itself for its security, the integrity of its political life and the well being of its people. In tangible terms, a nation needs security and development when in spiritual terms; a nation needs respect and recognition from international community. Securing the interest could enhance the political, economic, security, environmental, and/or moral well being of a populace and the state. According to degree of intensity, interests can be prioritized in four categories<sup>4</sup>:

- **Core/Vital Interests:** Vital interest represents the single most important interests for any actor and cannot be compromised. This is the very essence of the actor's existence; the protection of its citizens and their institutions assuring its security, freedom and independence, and enshrinement of its values. A nation is willing to sacrifice blood and treasure, in short to do whatever it takes to defend its vital interests. In BD perspective, vital interest may be – “Maintaining sovereignty and safe guarding territorial integrity.”
- **Significant Interests:** A significant interest is so important to an actor's well being that its leadership can only compromise up to a certain point. Although it may not affect national survival, yet can cause serious harm. Measures, including the use of conventional military forces can be opted to counter or deter the threat of action. For BD, significant interest may be – “Ensuring sustainable economic development and maintain human and energy security.”

4. Joint Operational Staff Work – B précis of National Defence College.



- **Important Interests:** These interests would be important but not crucial to an actor's well being. Important interests could cause considerable concern and harm and would likely be resolved with compromise and negotiation rather than confrontation. Some of such interests may include:
  - Resolving contentious issues with other states through negotiation.
  - Promoting internal security and stability.
- **Peripheral/Other Interests:** Peripheral interests neither involve a threat to the actor's security or the well-being of its populace, nor seriously impact the stability of the international system. Some of such kind of interests may include:
  - Developing a comprehensive National Security Strategy and Defence Policy for preserving National Interests.
  - Maintaining peaceful friendly relationship with neighbours and other related actors.
  - Developing and maintaining professional Armed Forces having deterrence capability and imbedded with values, ethos, patriotism and devotion.

**Elements of National Power:** National power is the aggregate strength or capacity of a state to achieve its national interests. Within the international arena, it may also be viewed as the ability of one state to influence another. Today, even strategic actors other than states also have elements of power to influence actions and affect others interest. Though there is no 'the set', yet some of the elements of power may include:

- **Geographic:** A state's geography is the foundation on which the remainder of that state's power is built. Geographic power is normally considered to be a force multiplier of other elements of power. The land mass of BD itself may not generate much power but if can be utilized as regional connectivity hub then can yield some benefit.

- **Economic:** Economic power is widely used in international relations to create long-term stable relationships. Trade also creates interdependence that can be both a blessing and a curse. The present standing of BD as a developing nation, this element does not offer much power. However, if coupled with geographic advantage, then it can make others dependent on her in the field of RMG, deep sea port etc., thus only may create some degree of influence.
- **Political:** Political power is the most used element of national power in international relations. Its application generally involves the lowest risk and highest chance of success. As the application of any element of power to reach a national objective ultimately depends on political decisions, the importance of politics to the military strategist cannot be over emphasized. The political system in simplest terms is the manner in which the state makes decisions and organizes its resources. However, BD is yet to emerge as politically stable strong state to influence the global actors in favour of her interest.
- **Military:** The military element through which the state may focus its national power most quickly but it also carries the greatest risk of escalation of violence and the possibility of a clear defeat in the attempt to achieve a specific national objective. Military power can only be applied within the political process imposed limits on the use of force to achieve a strategic objective. BD is trying hard to maintain a moderate Armed Forces purely for defensive purpose, thus she may not become that influential for resolving contentious issues by this element only.
- **National Will:** The national will element of power is the sum of the state's human resources. It is the element in which relatively intangible factors exert a considerable influence. There are generally no accepted standards of measurement that may be used to assess national will. Knowledge, logic, and experience must temper judgement in this area. Historically BD displayed strength in this field and in future also will

be able to rely much on it. Coupled with it, if the youth bulge can be integrated and utilized properly, it can become a viable strength for BD.

Though BD as state does not follow any specific set of elements, however discussed ones are generally used for academic purposes. There are various other models available:

<b>Table 1: Some of the Models of Elements of National Power</b>				
DIMEFIL (US Model)	PMESII (UK Model)	STEEPLEM	DEMPT	Constituents of a Nation
Diplomatic	Political	Social	Diplomatic	Rule of law
Informational	Military	Technological	Economic	Education
Military	Economic	Economic	Military	Commercial
Economic	Social	Environmental	Population	Humanitarian
Financial	Infrastructure	Political	Technological	Health
Intelligence	Information	Legal		Information
Law Enforcement		Ethical		Military
		Military		Economic
				Diplomacy
				Administration
				Governance

**National Resources:** National power of a state, which has three crucial substances: force, influence and authority, is heavily dependent on the national resources. This in turn largely shapes up the national interests, i.e. in international relations, how a state intends to behave and interact with other states or exerts influence. Old school of thinkers considered resources as all natural and static. But contemporary school of thought opines that resources are not confined to nature. More so, modern social academia considers resources can be made or created by human efforts and its nature is dynamic. Thus a new type – Technological Resources is

being widely discussed. Although there is some divergence in perception, yet national resources can broadly be categorized into four groups<sup>5</sup>:

- **Natural Resources:** Natural resources are materials and components (something that can be used) available within the environment like air, water, copper, wood, wind energy, hydro-electric energy, iron, coal, petroleum etc.
- **Human Resources:** This is about people. It is the resource that resides in the knowledge, skills, and motivation of people. Some believes that more the population, more the human resources. However, one needs to bear in mind that it is more about the quality, not the quantity.
- **Economic Resources:** Economic resources are the assets (things of value) which an economy (or business) may have available to supply and produce goods and services to meet the ever-changing needs and wants. Industrial base and infrastructure are considered to be major contributors to the economic resources.
- **Socio-psychological Resources:** These include national stability, leadership and political will. Without national stability, it will be hard to create the loyalty of the citizen to the government and build up relationship with other nations.

BD will have to capitalize more on human resources for her development and enhancement of national security. Side by side, endeavour for capitalizing natural and economic resources should remain on. Political leadership is needed to strive further for strengthening the socio-psychological resources.

**Realities of Constitution, Foreign and Defence Policy:** Article 25 of the constitution of BD states- “The state shall base its international relations on the principle of respect for national sovereignty and equality, non interference in the internal affairs of other countries<sup>6</sup>”. Though there

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5. Joint Operational Staff Work – B précis of National Defence College.

6. Constitution of the People’s Republic of BD.

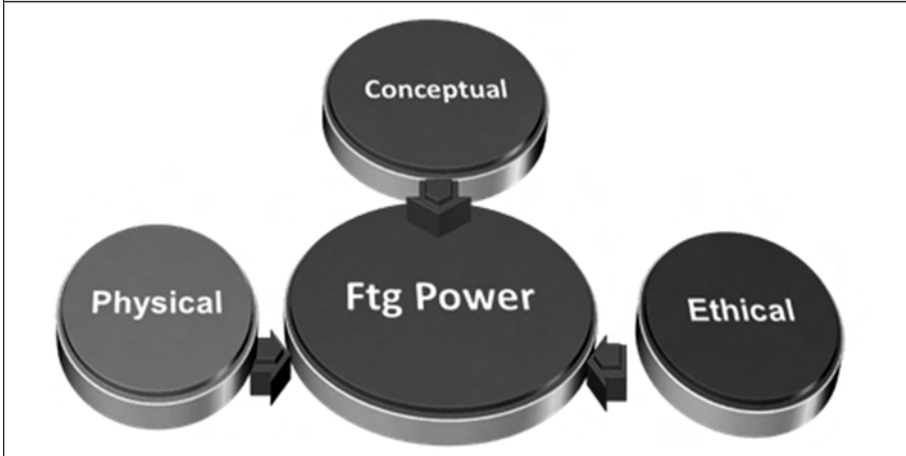
is no written foreign policy being circulated yet the theme “friendship to all, malice to none” is said to be the core essence of our all diplomatic engagements. Main focus is on solving the differences of opinion with others peacefully through negotiation and may even by adopting bilaterally accepted legal suits as seen in case of maritime delineation with MN and IN. As for defence policy which is not yet published but surely can be said mainly focuses on defending the sovereignty within own territorial boundary. BD Armed Forces’ participation in UN peace missions is also purely a response in humanitarian ground duly supported by constitution and does not reflect any kind of aggressive posture. Thus, it can be deduced that BD will be committed to resolve the contentious issues mainly by other means giving less preference to military option. Military option may be considered only if the core / vital interest is threatened and even then forces are likely to be employed in defensive posture within own territorial boundary.

**Requirement to Maintain Blue BD:** Recent delimitation of maritime boundary with our both immediate neighbours has created Blue BD in the south almost equal to size of the Green BD of the north. This has open up some new challenges in both economic development and security dimension. Even though from security and dominance point of view, immediate capacity building of Bangladesh Navy and Coast Guard demands priority yet it will not be confined to that only. This demands far wider attention at national level to extract full potential being offered by this Blue BD. A generation of sea farers to be created to build the image as sea faring nation, at least at regional level. As no prime national institute exists with the desired capacity, as such BD Navy with the support of the government will have to take the lead role. Next generation should be made aware of this potential field and talented people to be attracted for higher study, research and job market. Both national and forces’ development plans should have priority focus on it, which to be persuaded vigorously.

## Fighting Power and BD Armed Forces

**Fighting Power:** Fighting power of any Armed Forces consists of Physical, Conceptual (Training and doctrine) and Moral (Ethics, Values and Ethos) component as shown in figure 1. Physical component generally refers to the size of the Armed forces including its equipment and facilities available. Conceptual component refers to the standard of training, concepts and doctrines for utilizing the forces most effectively in any crisis situation. Moral component though refers to the mental state of the force yet it directly relates to ethical standard of the forces individual members and organization as well.<sup>7</sup> These three components' multiplicity produces the fighting power of a force that counts. Thus, it will be difficult to have full potential without a balanced development of all these components. Off these three components, lower ethical and moral standard will have much negative impact even if the other two remains relatively better. Because even in the era of drones and Nano-technology etc., still the men behind, matter most. Thus human dimension, along with, ethical standard will continue to influence future conflicts, which can't be negated by any degree of technological advancement.

**Figure 1:** Components / Elements of Fighting Power<sup>8</sup>



7. AHQ project study paper of 66 Infantry Division of 2014.

8. Joint Operational Staff Work – B précis of National Defence College.

**Ethical Dimension:** This dimension revolves around some theoretical understanding alongside its practical applications. Related terminologies are:

- **Values:** Values can be defined as those things that are important to or valued by someone. Values are the embodiment of what an organization stands for and should be the basis for the behaviour of its members. Values provide the basis for judgments about what is important for the individual member or organization to succeed in its core business.
- **Ethics:** Ethics may be defined as the set of moral values and principles that distinguish what is right from what is wrong. Ethics, therefore, aims to study both moral and immoral behaviour in order to make well-founded judgments and to arrive at adequate recommendations<sup>9</sup>.
- **Ethos:** This is the characteristic spirit of a culture, era, or community as manifested in its attitude and aspiration<sup>10</sup>. The fundamental character or spirit of a culture; the underlying sentiment that informs the beliefs, custom, or practice of a group or society is called as its ethos<sup>11</sup>.
- **Organizational Ethics:** Organizational ethics is the ethics of an organization and it is how an organization responds to an internal or external stimulus. Organizational ethics is interdependent with the organizational culture.
- **Comparison:** Comparisons between the Core Values of some of the Armies are shown in the table below, which are mostly individual centric (concerns members only, not the organization as a whole):

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9. A Comparative Analysis of Conventional Ethical Code, and Islamic Ethical Code in Accounting Profession, Md. Kamal Hossain.

10. [www.oxforddictionaries.com](http://www.oxforddictionaries.com) accessed on 07 December 2014.

11. [www.dictionary.com](http://www.dictionary.com) accessed on 07 December 2014.

**Table 2: Comparisons between Core Values of Different Armies<sup>12</sup>**

US (7)	UK (6)	Canada (4)	Philippine (6)	BD (10)
Loyalty	Selfless Commitment	Duty	Love of Country	Honour and Pride
Duty	Courage	Loyalty	Valor	Honesty and Integrity
Respect	Discipline	Integrity	Honour	Loyalty
Selfless Service	Integrity	Courage	Loyalty	Patriotism
Honour	Loyalty		Duty	Trust and Faith
Integrity	Respect for Others		Solidarity	Respect
Personal Courage				Justness
				Service before self
				Courage
				Comradeship

**Uniqueness of Military Service and Society:** Since time immemorial, military is a diverse entity within the greater society having distinct recruitment, training and organizational culture<sup>13</sup>. Soldiers have the responsibility and legal right to use lethal force and may be required to lay down their lives and risk those of their comrades. Thus prescribed set of values for Army has to be different than that of the greater society. However in maintaining so, military needs to guard against the danger of being isolated totally. Introductory remarks of Values and Standards of the British Army Doctrine say “It is operational effectiveness that requires the Army to have values and standards that are different”.<sup>14</sup> Presently, a trend exists to compare the military service with the corporate society in respect

12. AHQ project study paper of 66 Infantry Division of 2014.

13. AHQ project study paper of 66 Infantry Division of 2014.

14. Values and Standards of the British Army, published in 2008.



of facilities and job environment. But these two fields are characteristically different, as the corporate world looks for the profit maximization where generally ethics is over shadowed by that objective. On the other hand, military service demands its members to stand against all odds for the cause of the Nation and make supreme sacrifices once needed. Thus this can be stated clearly that military service is unique and demands to maintain relatively higher ethical standard.

**Modernization of Armed Forces:** Forces development at BD is going on based on Forces Goal-2030. Here beside the expansion of the outfit of three services, importance is given on the enhancement of capabilities from functional point of view. Human Resource Development is also given focus. But it is a reality that arms race has no end and thus BD faces tremendous challenges for modernizing her standing conventional Forces. Thus BD needs to carefully evaluate the ways and means to make the Forces most effective with deterrence capability, contributing to national security. SINGAPORE emphasized on a total defence owing to the lack of territorial depth to embrace economic, social, psychological defence and the bedrock of military defence<sup>15</sup>. Along with other lines founder President LEE KUAN YEW focused on developing and building the Army from scratch right after the separation<sup>16</sup>. Today Singapore Armed Forces stands as a credible deterrent modern force of the world, which can serve as reference for BD in present perspective.

**People's Integration:** The concept of blending Unconventional Warfare (UCW) with conventional one is viewed as a viable option to offset or counter the perceived superiority and integrating of general people in the overall defence effort of the country. BD is having its glorious history of mass participation in the War of Liberation. Situation and the circumstances are likely to be different in any future conflict. At that time, whole nation was ready for a struggle for the independence but in future

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15. Simon S. C. Tay "A Mandarin and the Making of Public Policy" published by National University press of Singapore, 2007.

16. Marshal Cavendish Edition, "From Third World to First- Memories of LEE KUAN YEW" by Singapore press Holdings, 2009.

it will be defending the motherland. Besides 'Levee En Masse' of French revolution and CH people's movement by great leader Mao Tsetung also support the concept. The draft doctrine titled<sup>17</sup> 'Blending Unconventional Warfare with Conventional Warfare' has outlined different aspects of UCW giving emphasis on force generation. The success will greatly depend on the understanding the concept and acceptance of it at the local level, where stake holders will be the mass population, local administration, public representatives etc. The creation of sense of belongingness and the mindset of the masses of being part of the overall defence effort will be vital here. The conflicts around the globe like Iraq, Afganistan, Syria, Ukraine etc. clearly display that it is very difficult to completely defeat and subjugate any nation even for the world's military might. This happens mainly because the leadership could convince people of those countries that present state is temporary one and will be reversed in future. Thus for BD in an environment of defending own territory, people's integration with military through blending concept is likely to give more dividend rather than merely focusing on Force generation.

**Maintaining Operational Efficiency and Ethics:** Any Force being superior in physical and conceptual component will fail to generate its full fighting power if it lacks in ethical component. Same happened in the Battle of AJNADAYAN (now falls in Israel and Palestine) between Muslims and Romans in July 634.<sup>18</sup> Roman commander KAYKALAN sent spies and the findings revealed that Muslims inferiority in physical and conceptual component was compensated by the superiority in ethical side. In over two hundred battles and engagement with the Persians and Byzantines by Muslims, display the similar phenomenon. Newly formed Muslim states conquer over two super power of the time (Persian and Byzantine Empires) certainly had the elements of statesmanship, strategic leadership and above all, fighting power potential of the Muslim forces imbedded with very high ethical standard. This clearly displays the vital importance of ethical component of fighting power over other two components. This

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17. The Draft Doctrine on "Blending UCW with Conventional warfare" March 2004, published by AHQ.

18. Al Bidaya Wan Nihaya, Volume 1 to 10, translated and published by Islamic Foundation of BD.

also can be deduced that supremacy in other two components may put any forces in some advantageous position apparently but certainly lacking in ethical component will inevitably result into disastrous consequences. Thus here may be a food for thought for the Armed Forces of the developing nations like BD from this trend. Undoubtedly decay in ethical standard will inevitably lower the individual professionalism and overall operational efficiency of any force. Army Regulation (Instruction) 7 delineates, maintaining operational efficiency for war is a command responsibility. If the operational efficiency cannot be maintained, Army and in turn BD Armed Forces will fall short of constitutional obligations too.

### **What is The Option for BD?**

Geo strategic setting and present realities justify that BD needs to have credible Armed Forces to maintain and secure her various interests. The question is how big and with what capability the forces are to be organized? Commonly, two types of planning are done for Force structuring. These are threat base and capability based planning. For country like BD, surrounded by big actors, matching with them is likely to remain as a never ending race. Taking the fact that BD Armed Forces mostly will be engaged to defend the motherland, developing required degree of capability to deter any aggressor and able to react suitably in case of any violation seems to be more appropriate. Thus BD mostly needs to adopt a capability based planning rather than joining the arms race following the threat based planning model. Here decision makers will be left with the better option to make a balance between economic realities and developing Armed Forces as credible deterrent tool, which will be reckoned by all. In the physical component, deterrence capability to be achieved by increasing the long range indirect delivery means for all three services, which will deter any evil venture, rather than merely increasing the outfits.

For enhancing the efficiency of the Armed Forces beside physical and conceptual component, due focus will have to be given on the ethical dimension. Because for defending motherland, human factor will play

a predominant role. Thus, Ethical dimension of fighting power to be formalized and persuade vigorously by policy makers, commanders and the institution, as a whole.

Main deterrence capability and very survival of Armed Forces facing any odds will mostly depend on the people's integration in overall defence effort of the country. Thus doctrines like blending conventional warfare with unconventional warfare or defence policy should focus more on people's integration with Armed Forces in the overall war effort. If the popular support remains with the Armed Forces that will also augment the moral component and deter any aggressor thus complementing the effort of defending our beloved motherland.

Overall Defence Strategy of BD needs to focus taking general people onboard; always making them part of it. Armed Forces to focus on upliftment of the ethical dimension of her members. This to be capitalized as the main strength of the fighting power. Modernization to be focused on attaining credible deterrence means, to be reckoned by aggressor before any engagement. Only Armed Forces, which is morally upright having popular support can very professionally utilize their capabilities to effectively defend the motherland. But if devoid of ethics and popular support, same will fail to defend the motherland, it does not matter how big the Force is or how modern and developed it is.

## **Conclusion**

While formulating the defence strategy, main inference to be drawn from the War of Liberation. Besides historical examples of small states defending their motherland against big powers to be consulted mostly instead of the references of the big powers expeditions. Righteousness of the cause and justness of the engagement to be taken into consideration by the policy makers in the decision making process. Policy makers also need to take into consideration the domestic dimension in terms of the aspiration of the people & the state and capitalized on the actual strength

that is population and popular support along with the resilience of the society. Only then the strategy is likely to be a homemade one soothing the requirement in BD perspective making it meaningful and effective serving the purpose of securing vital national interest and her existence.

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